



MUSEUM
ALLIANCE

QUARTERLY

LOS ANGELES
COUNTY MUSEUM
OF NATURAL HISTORY
VOL 4 NO. 4
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IN THE GOOD OLD SUMMERTIME — 1900
THE WORLD OF JADE
FOSSILS ARE FOR DIGGING
LEATHER, CANDLES AND SOAP
BIG BUSINESS IN AN EARLY MISSION YARD
MEMOIRS AND MOMENTOS —
THE FRAGMENTS OF HISTORY
ELEPHANTS — a special supplement



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ORIENT TOUR

The Alliance Orient Tour left Los Angeles on November 4th, forty-seven strong. Many of us had never before traveled with a group and we approached the situation with a degree of strangeness.

We were from many walks of life — doctors, lawyers, secretaries, a nurse, an actor and actress on their 25th wedding anniversary trip, retired folks, wives and mothers, businessmen, an animator, a carpenter, a cameraman.

By the time we left Tokyo four days later, we were a firmly-knit group who had taken to our hearts not only our own Los Angeles travel agent, but also our three representatives of the Japanese tour agency who served us throughout Japan.

The Japanese were wonderful hosts, and we were charmed by Kyoto, Nikko, Hakone and Tokyo (to name a few). Hong Kong proved to be an absolute paradise for our compulsive shoppers, many of whom left with a few regrets. Bangkok's river life and temples provided a perfect locale for our shutter-bugs. Singapore, with its open spaces, native music and lush vegetation, was a happy surprise—and the new Taipei Museum alone would have made the whole trip worth while.

We had grown close traveling together, and the last week people started saying, "I don't want this to end!" Then, suddenly, in Honolulu, came the horrible moment of truth—Customs; after which the group was separated—some staying on in the Islands.

Our experience was wonderfully stated on a Christmas card:

"It was so frustrating, after we were through Customs, to find everyone was gone—it was like stopping a good conversation in the middle of a sentence."

A Singapore sidewalk cafe.



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QUARTERLY

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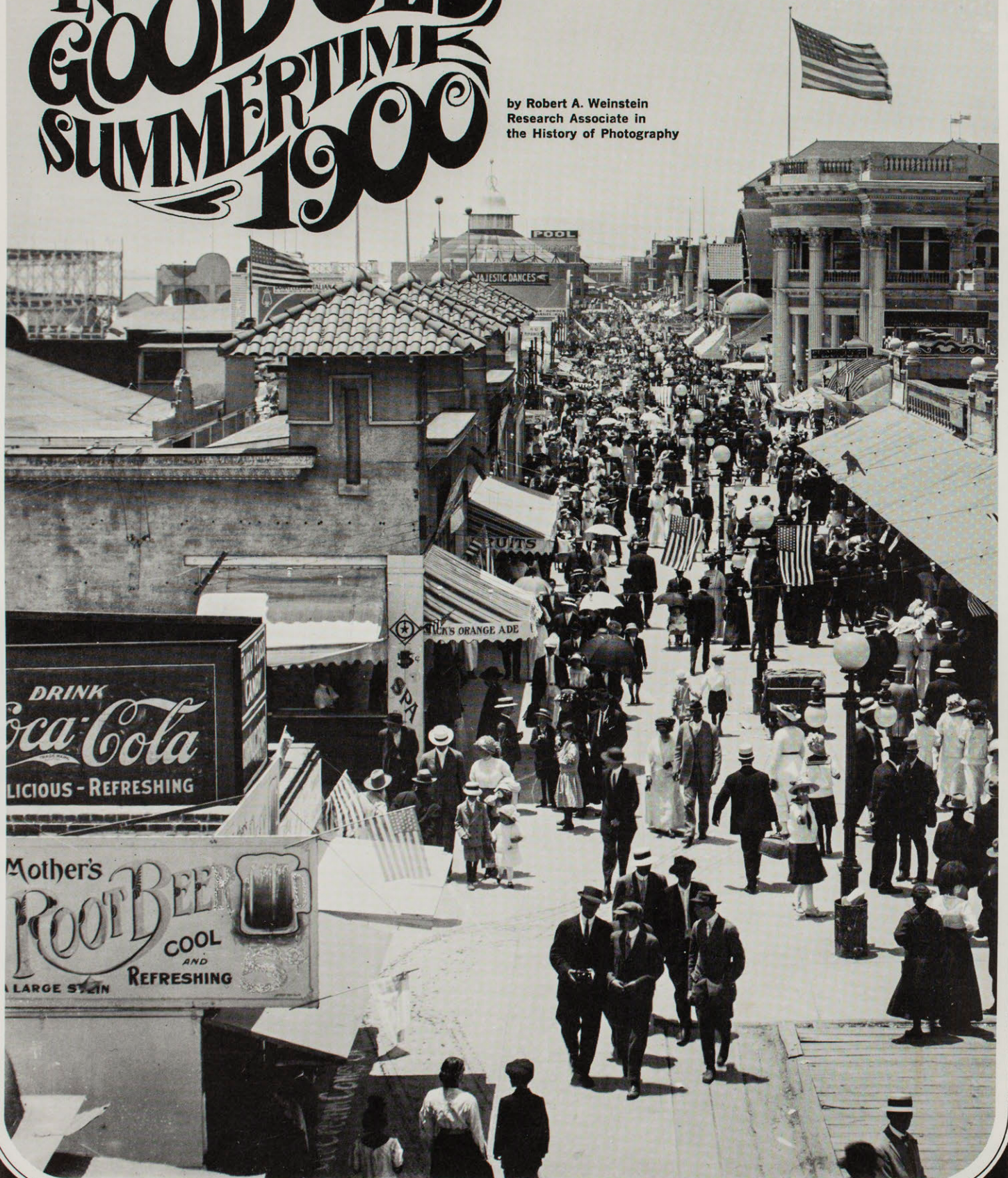
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IN THE GOOD OLD SUMMERTIME 1900

by Robert A. Weinstein
Research Associate in
the History of Photography



The French say, "The more things change the more they stay the same."

The idea seems least true in Southern California. In the last sixty-five years **everything** here has changed steadily, rapidly and profoundly. The Greene Collection of Historical Photographs, a recent acquisition of the History Division of the Los Angeles County Museum of Natural History, contains visual proof of these changes.

Going back in time as far as the late 1880's, this collection of negatives and prints is an exciting record over the years of the look of the land, the changing scene, and the manners and modes of Southern Californians as well.

A small selection from this collection of prints serves to show us now the Southern California that was . . . the place that so many people yearned to visit. To some of our more recent arrivals this "old" Southern California must seem quite unbelievable.

Here indeed can be seen the unique combination of the mountains and the sea in one glance, the towering palms framing snow-capped mountain peaks, beautiful tree-shaded lakes, wide sea-swept beaches, shaded rustic trails, and, overall, the sweet smell of orange blossoms . . . the Southern California that was so incredibly attractive. Although these beaches, mountains and canyons were much more difficult to reach in the early days than they are now, our photos show that the vintage Southern Californian of that day was not deterred by hardship and difficulty.

While the horse and buggy replaced the present-day automobile, and the dirt trail was the forerunner of the freeway, the well-stocked picnic basket was the then popular equivalent of the ubiquitous, present-day "drive-in". . . and crowds flocked then as well as now to the wide range of natural resorts all over Southern California.

While sky-scraping condominium apartment houses now dot the Pacific seashore . . . the only visual impediments in the 1900's were the



The glass-bottomed boats of Avalon Bay were the supreme magic touch for all Catalina visitors . . . young as well as old. Genuine excitement and real wonder were provided the spectator by these floating aquariums as well as a bonus, free harbour tour.

◀ Naughty and nice . . . the exciting Pike at Long Beach was every early Southern Californian's idea of an unforgettable week-end visit to the beach.

Oil . . . Black, crude oil was the secret underground wealth of Southern California. Everybody . . . and everything gave way to the mushrooming oil derricks; some of which are seen here at First Street and Glendale Boulevard in Los Angeles.





It looks like Venice . . . it is even called Venice, but it isn't Venice . . . that is, not Venice, Italy. Providing gondolas, Italian gondoliers, arched bridges and winding canals the Southern California Venice was rarely overlooked by the beach-going weekender.



The Ship Cafe at Venice . . . more cafe than ship reminded those beach visitors who knew already of the white-winged sailing ships used by the Spanish explorers that discovered California and claimed it for Spanish rule.



Architectural marvel—monument to the California woodworker's art . . . the still-standing, rambling Hotel Coronado on San Diego's Silver Strand was host in turn to Presidents, Kings, Queens, millionaires, robber barons, foreign dignitaries and hundreds of thousands of vacationing Southern Californians.

Beach time in Southern California . . . any Sunday afternoon in summer or spring any spot of crowded sand . . . any assorted couple of thousand people of all ages . . . any number of gaudy beach umbrellas . . . numberless bathingsuits, picnic hampers, cold drinks, good humour . . . all this topped off with plenty of sunburn.



wooden oil derricks near golden Signal Hill and Huntington Beach.

Those early days had their share of beauties and excitements. The canals at Venice were filled with water . . . clean water, and gondolas plus gondoliers were available for hire. The stagecoach ride over the Catalina Island hills was an eye-filling treat not to be missed. The glass-bottomed boats at Avalon were the substitute then for the snorkled and aqua-lunged swimmer of today. The evening fireworks displays were substantial and spectacular indeed. The 1900's were the days of the beach umbrella, the striped tent on the beach at Coronado and the rope life line stretched into the breakers at Ocean Park. The dresses were long and so were the bathing suits. The Midway and Pike were running then . . . just as naughty but not quite so nifty. The rides were twice as high and twice as dangerous (or so it seemed) in the pier amusement parks. The crowds were as big, the food as spicy, the heat as annoying, the sand as hot and the many children seemed to cry as often and as loud—all as it is today.

The difference was that the way home in 1900 was leisurely and beautiful. There was **no** smog, there were **no** freeways, fewer billboards, fewer hot-dog stands, fewer neon signs, fewer busy boulevards, fewer people and **more** of the good things for which Southern California used to be famous.

One had his fill then of endless blue skies, pure sweet-smelling air, clean beaches, kelp-free ocean, breath-taking panoramas and the incredible sense of personal delight at this "wonderland of nature."

All of these "yesterdays" are preserved for us on film to recall and enjoy in absentia as the Southern California of today changes and grows into a major Pacific megapolopolis of tomorrow.





The trip of trips was to Catalina Island. Here at Avalon Bay the Sunday visitor could eat well, sleep soundly, row boats in the Bay, fish and finally ride with the Banning horse-drawn stagecoach over the twisting Catalina hills.

When the tall trees were higher than the highest building, Westlake Park in central Los Angeles was well worth a family visit. Smog-free, uncrowded and plenty of room for the breeze to blow a sailboat 'round the jewel-like lake . . . ah me.



THE WORLD OF JADE

by Hubert Dafoe Oakland Museum



NEPHRITE VASE—A beautiful white nephrite vase carved in Indian style seven centuries ago. Finely hollowed to egg-shell thinness, it is twelve inches high but weighs less than one pound. On loan from the Estate of Chang Wen Ti.

When the Spanish conquistadors invaded Mexico and Central America, they noted that the indigenous tribes placed great value on a native green stone which they carved and polished for ornamentation and ritual purposes. They also recorded that certain therapeutic values were ascribed to these green stones, specifically that they would relieve ailments of the kidneys and loins if worn on one's person.

To these stones the Spaniards gave the name "piedras de ijada," which, translated, means stones of the loin or flank. Many such stones were shipped back to Spain along with stories of their miraculous healing powers. As a consequence, it became popular among members of the wealthier classes in Spain and throughout parts of Europe to wear a "piedra de ijada" as a protection against kidney diseases.

In publishing a story about these stones, a printer is reputed to have corrupted the word "ijada" into "le jade," when translating it into French. Subsequently, when the French term was translated into English, the article "le" was eliminated and a new word, JADE, evolved.

Also, when translating from Spanish into Latin, "piedra de ijada" becomes "lapis nephriticus," meaning "stone of the kidney." Subsequently, in the 18th century, when some similar appearing green stones were discovered in Europe and were identified by scientific means as a new mineral, it was given the name NEPHRITE in recognition of its previous identity as a kidney healing stone.

Later, in 1863, a French scientist made a study of some green jade-like carvings from China, which resembled nephrite. He declared them to consist of a new and distinct mineral, which he named JADEITE.

Thus, through devious origins, the mineralogical names, jade, nephrite, and finally, jadeite were evolved.

Today jade is used as a generic term to include the two minerals, jadeite and nephrite. They differ in

chemical composition but are closely related in physical properties and appearance. Both are remarkable for their durability and toughness. The many beautiful colors in which they occur are due to included impurities. In their purest form both minerals are white.

Nephrite, considered as the true jade of China, has traditionally been the material from which their neolithic tools and weapons, their ritual and ceremonial objects have been fashioned. From ancient times it has been the medium through which the Chinese gave expression to their thoughts, philosophies and their artistic talents.

Jadeite, the colorful material from which many of the later jades are carved, is believed to have been introduced into China from Burma during the 18th century. Due to its intense colorings, high luster and translucency, it attained popularity during the reign of Ch'ien Lung (1736-1796), renowned imperial patron of the arts. Jadeite has continued to enjoy popular usage for jewelry and fine ornamental carvings, commanding high prices.

Contrary to popular belief, jade is found outside the Orient. As previously mentioned, jade was highly esteemed and used for ornamental, ceremonial and therapeutic purposes by the ancient cultures of Meso-America. In more recent times deposits of jade have been discovered in Europe, Africa, New Zealand, Japan, Canada and the United States. It has been revealed that many of the native tribes, adjacent to these deposits, also used jade in the manufacturing of utilitarian objects,—notably, the early dwellers in the Swiss lakes region and the Maoris of New Zealand. However, none of these later discoveries has approached the Asiatic sources in quality, value or importance.

Curiously, there is no record of jade having been found in China proper. It is recognized that jade was worked in Kansu province some 3000 years before Christ, but it has not been determined where this material was obtained. The possibility exists that there may have been

sources of jade in prehistoric China, but if so, these were exhausted at an early date and their identity lost.

At present, the United States Customs Department does not permit the importation of Chinese jade carvings or jewelry into this country. This restriction is being enforced to eliminate under-cover, illegal trade with Communist China, where a jade trade could readily assume sizeable proportions. Burma has recently closed her borders to export and the extensive New Zealand nephrite deposits are under control of their government, which prefers to develop trade in manufactured jade jewelry and novelties rather than bulk export.

While these restrictions have somewhat curtailed jade importations into this country, there has coincidentally developed a remarkable interest in the location and development of local jade deposits. This new interest has been stimulated to a major extent by amateur lapidary hobbyists, frequently referred to as "rockhounds." Commercial deposits have been located in Alaska, Yukon, British Columbia, Wyoming and California. While not considered as fine gem quality, due to mottled colorings and inclusions, these latter deposits are of considerable importance to amateur cutters. Significantly, this has brought about a remarkable addition to the formerly somewhat exclusive field of jade collecting through the expanding ranks of the amateur hobbyist.

The "WORLD OF JADE," currently on exhibit in the Museum, is one of the most interesting and comprehensive displays on the subject that has been assembled in the West. Combining a diversity of interests, there is literally "something for everybody" in the exhibit—from mineralogists, archeologists, historians, educators, bibliophiles, art and jade connoisseurs to the average viewer "off the street," who is quite openly attracted by the beauty and uniqueness of the exhibit.

Central theme of the exhibit is the impressive Jade Pagoda, which

was obtained on loan from the Oakland Museum through the good will of the family of the late Chang Wen Ti of Los Angeles, who had recently deeded it to that institution. Mr. Chang, an ardent jade collector from Shanghai, was the inspiration behind the design and construction of the Pagoda. In 1918 he purchased sections from a huge apple-green jadite boulder, weighing 18,000 pounds, which had been mined in Burma and shipped to China for cutting. It is recorded that approximately 150 skilled carvers labored for the next ten years to complete his monumental masterpiece.

The Pagoda tower consists of seven fitted stories with delicate balconies between them. Fifty-six jade wind bells are carved out and suspend, still attached, from the roof eaves. The overall height is fifty-one inches and the diameter at the base is thirteen inches.

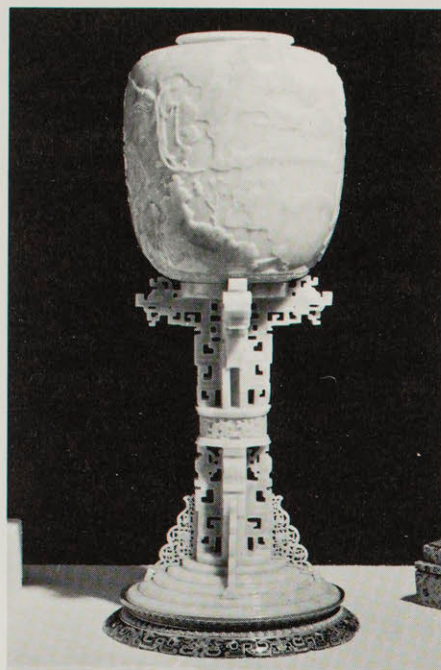
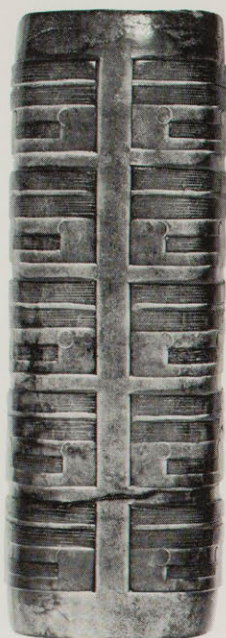
Playing a subordinate architectural role are the graceful teak wood terraces augmented by delicately carved jade stairways and balustrades. An impressive Memorial Gate fronts the main approach. Miniature jade replicas of ceremonial pieces used in ancient rituals complete the design. All of the foregoing, including the Pagoda, having been carved from the original jadeite boulder.

The "WORLD OF JADE" exhibit presents the story of jade beginning with its mineralogical composition and origins, its early utilitarian and ceremonial uses, through the zenith of Chinese culture to current usage and interests.

Significantly, the first display in the exhibit deals with the scientific aspects of jade—its atomic structure, physical and optical properties together with some of the representations of the various colors in which it occurs. California locations of jade deposits are also represented.

Another display tells the story of the uses of jade from prehistoric man to the present day. Illustrated in the exhibit are examples of ancient ceremonial pieces used by the

TS'UNG—This magnificent Ts'ung of the Han dynasty is a sacrificial object symbolic of the earth. It is a round cylinder enclosed within a prism. In tombs the Ts'ung, or earth symbol, was often placed on the chest of the dead, while the Pi, or symbol of heaven, was laid under the back. Thus the dead rested between heaven and earth. On loan from Mr. and Mrs. Hubert A. Dafoe, Oakland.



JADEITE PALACE LAMP—One of a pair of large jadeite Palace Lamps carved as replicas of ancient candle lamps of the Han Dynasty.



WHITE NEPHRITE VASE—A handsome double vase in white nephrite. It is carved in the Lin-Tse or sacred fungus shape which symbolized longevity. On loan from the Oakland Museum.



MAUVE JADE FIGURINE—A delicately carved mauve jadeite figurine with a polished mauve jadeite boulder exhibiting a characteristic yellowish-brown rind. On loan from Mrs. Hubert A. Dafoe.

Chinese, together with examples of more practical applications as their civilization developed. Modern usage is almost entirely restricted to the manufacture of art objects, jewelry and other forms of ornamentation. An exquisite jade necklace, lent by the Santa Barbara Museum of Natural History, and a multi-colored jade bracelet on loan from Gumps of San Francisco enhance the exhibit.

A colorful map pin-points the localities in which jade has been found throughout the world and is supplemented by a display of jade adzes, celts, beads, axes and other artifacts from various regions.

Historical Chinese periods are depicted, using the medium of jade carvings to represent the various dynasties; this is a special loan from the Eugene Fuller Memorial Collection of the Seattle Art Museum. The development of jade carving from simple archaic pieces to the deeply undercut, free-flowing modern stylings is chronologically demonstrated.

One of the most magnificent examples of the art of book-making in modern times complements the exhibits. The two folio volumes, "Investigations and Studies in Jade," of which only 100 copies were

printed in 1906, are on loan from Mr. Herman F. Miller of Los Angeles.

Also on display from the estate of Chang Wen Ti are several cases of carvings from his outstanding collection, which were featured, with the Pagoda, at the Century of Progress, Chicago 1933-34, and the Golden Gate International Exposition, San Francisco 1939-40. These are notable for their superior quality, colorings and delicacy of carving. Among important pieces is a large jadeite plaque mounted as a table screen. The unusual colorings and patterns of this jade stone form natural scenes which have been accentuated by gold incising. There is also a pair of large Palace Lamps notable for the size and shell-like translucency of their globes, which are covered with beautiful bas-relief carvings.

The exhibit includes an unusual display of beautiful lavender, or mauve, jadeite carvings. This rare collection is on loan from Mrs. Hubert A. Dafoe of Oakland.

Most viewers, accustomed to thinking of jade only in relation to its more common green colorings, are surprised at the great variety of hues in which it appears.

The bright green colorings of jadeite are imparted by inclusions of chromium. The delicate mauves are due to the presence of small quantities of manganese. Various compounds of iron are credited with giving the wide range of subtle colorings to nephrite.

Traditionally jade has always been regarded by the Chinese as possessing the highest virtues and deserving of the deepest veneration. Perhaps their feeling for the stone is best expressed in this ancient writing:

Benevolence lies in its gleaming surface.

Knowledge in its luminous quality.

Uprightness in its unyieldingness.

Power in its harmlessness.

Eternity in its durability.

Moral leading in the fact that it goes from hand to hand without being sullied.

ELEPHANTS



A special publication of
the Museum Alliance of
the Los Angeles
County Museum
of Natural History



The journey of
five elephants from
the Kenya bush to
The Los Angeles County
Museum of Natural History



**A STATEMENT BY HERBERT
FRIEDMANN, DIRECTOR,
LOS ANGELES COUNTY MUSEUM
OF NATURAL HISTORY**

Everyone knows the elephant, and everyone noted its absence from our galleries. A trained zoologist might have thought that a group of still another kind of antelope would enhance the ten or a dozen kinds already shown, but the general public would not have been disturbed by, or even aware of, its absence. But elephants are different. This ponderous beast, the largest of living land animals, is something visitors hope to see when they visit a large natural history museum, and until now their disappointment at not seeing one here was not always kept silent.

As the following pages will show, it is no small or easy task to go out and collect, preserve and bring back in exhibitable condition five of these huge beasts. Much advance planning, careful study and devoted labors of many persons went into the task of bringing to the people of Los Angeles the first and only full scale habitat group of African elephants anywhere in the world.

HOW SAFARI BECAME EXPEDITION

It has been said that of all the ingredients of success, the one that is most important is timing. Certainly this can be said of the multitude of coincidences which first fell into a pattern in 1962 and which now have combined to produced for the Los Angeles County Museum of Natural History an exhibit of African elephants that is not likely to be equalled or surpassed in the foreseeable future anywhere in the world.

Consider for a moment a few of these elements of timing. By 1962, Los Angeles County was the most populous in the United States. Its explosive growth was continuing apace, yet order was emerging from the chaos resulting from "everyone being from somewhere else." The cultural starvation of the city began, finally, to get the attention it needed.

A new art museum was in the works. The Music Center was under construction. City beautification was the order of the day . . . being administered by public-spirited citizens who had come to realize that Los Angeles was headed for greatness among the cities of the world.

There were other coincidences. With the County's art treasures be-

ing moved into new quarters, additional space was to be available for science and history exhibits in the older buildings at Exposition Park. Those who have seen the magnificent grouping of American bison in the North American wing will also remember that its counterpart in the African Hall was not up to modern standards for habitat groups. There were too many kinds of animals in the water hole scene to present a clear picture of an authentic water hole. The towering bull giraffe donated to the Museum by John Jewett Garland was the only one of the specimens museum officials considered to be worthy of inclusion in a habitat grouping of elephants.

Again, a fortunate coincidence occurred. Two members of the governing board of the County Museum, the late Tom R. Knudsen, creamery company executive, and Maurice A. Machris, oil man, were both long-time big game hunters with numerous African safaris to their credit. As luck would have it, when Dr. Herbert Friedmann, Museum Director, first suggested that an elephant habitat group would help to make this museum famous throughout the world, both Maury Machris and Tom Knudsen had been planning new African safaris independently of each other. The two men agreed to pool their efforts into one expedition which would collect four of the mighty animals.

Initial research and planning produced some interesting facts: there was not a single diorama or "natural habitat" group of elephants anywhere in the world. True, the American Museum of Natural History in New York has a grouping of seven of the animals, but these are standing in the middle of the African hall and are not supported by either the local flora or fauna or painted backdrop that is today considered essential to bring a natural history exhibit to life.

The idea that the entire expedition would be planned from start to finish for the sole purpose of obtaining a single exhibit proved to be as wise as it was a revolutionary decision. It meant that every piece of

equipment, all the scientific knowledge, and in fact, all the needed personnel could be chosen from specialists who would train for this one assignment. It meant applying modern techniques of animal sculpture and taxidermy on a scale never before attempted. The elephants in Akeley Hall in New York had been collected over a period of 12 years. Taxidermy had taken 14 years, counting the period of World War I, during which work was stopped.

Ambitious plans for the complete exhibit at the Los Angeles County Museum of Natural History called for an opening date within three years of the end of the expedition. To do this meant having all four elephants in process at one time. As it turned out, Kenya's Game Warden in the area where the animals were to be collected opened the way to obtain a fifth elephant on the assumption that it would be impossible to obtain four perfect specimens without at least one of them being lost or damaged by weather, climate, shipping accident or difficulties in the preservation of the skins.

It is to the credit of all concerned that the five elephant hides were obtained exactly as planned. Since the opening of the exhibit on April 26, 1966, they stand exactly as they were in real life in their native habitat near the Tana River area of Kenya. There is not a blemish on a single animal . . . so perfect was the preparation of the hides.

A unique term has been coined to cover the preparation of the animals. Called "sculptuderm," it implies that each animal is, in effect, an actual life-size sculpture of an elephant. The only taxidermy in the usual sense is the way the skin is fitted over the sculpture. The two most expert animal sculptors and taxidermists in the world today, George Adams of the Los Angeles County Museum, and Louis P. Jonas of New York, who personally prepared four of the animals, consider the elephants in this exhibit to be the finest work of their long careers, and the exhibit as a whole to surpass any other natural exhibit they have ever seen.



THE KNUDSEN-MACHRIS KENYA EXPEDITION

by D. Rodney Lee
Historian for Knudsen-Machris Expedition

The five elephants now standing by a waterhole in the large exhibit at the end of African Hall at the Los Angeles County Museum of Natural History represent the only natural habitat family grouping of elephants in the world that is authentic in every detail. All five of the animals were collected during the Knudsen - Machris Expedition to Kenya in 1963.

Each animal was individually selected in order to make the family group as nearly typical as possible of the primary African elephant family. All were collected within a few miles of the Tana River in Kenya's open flat bush country. Those who have been to this part of Kenya and who have now seen the actual exhibit say that it gives them the odd sensation of having suddenly been transported back to Kenya; so life-like is the whole setting.

The story of the preparation of these elephants for this magnificent exhibit appears elsewhere in these pages, but the choice of the actual animals collected, as told by eyewitnesses who were on the expedition, is an important part of the whole picture. It involves minute knowledge of the African elephant, his habits, his moods and his temperament, especially as these relate to his only real enemy, man.

Every member of the expedition: Mr. and Mrs. Maurice Machris, Mr. and Mrs. Tom R. Knudsen, the scientists, photographers and writers . . . all compiled detailed notes during the weeks the elephants were hunted. These accounts have been drawn into a sequence which represents the more or less typical conditions which existed at the time the animals were collected.

There was glamour and constant danger, of course. An African elephant can be the most unpredictable and dangerous animal alive. It can also be as timid and frightened as a mouse.

There is a great deal more to an elephant hunt than those few seconds during which the hunters and the taxidermist must decide whether they have found "the" elephant for the museum collection. As

has been shown elsewhere, the general sizes, shapes, ages and structures of the animals were decided upon even before the expedition left Los Angeles. To a lesser degree, each day's hunt was the result of careful preplanning.

A typical day on the expedition began around five in the morning at the main camp, a complex village of canvas tents located in the forest belt of towering croton trees along the red-brown, muddy Tana River. Even the most routine hunt started several days before the vehicles left the camp, when Waliangulu and Orma scouts set out on foot, armed only with knives and bags of meal, to cover some thirty to forty square miles of dense bush and open savannah exactly as now appears in the finished habitat exhibit.

The main object of the scouting is to find evidence of fresh elephant spoor. Spoor is a general term for all animal signs. With elephants it means fresh tracks or droppings beside a water hole. It means a single broken branch . . . or the fibrous cud dropped by the elephant after he has chewed all the juice and nourishment out of the sisal-like *Sansevieria* leaves. (These can be seen at the right side of the exhibit.) It may mean the imprint of a huge pad in the dry dust, imprints that leave an almost photographic likeness of the corns and calluses that cover the soles of the elephants' feet. An alert Waliangulu scout can tell you the size, age, and even the sex of an elephant by a single print! Spoor can even mean the actual scent of the elephant, which becomes noticeable to anyone when the animals are really close.

Before dawn of every day, the British-built Landrovers (a Jeep-like four-wheel drive vehicle) were packed and ready for action. Guns, ammunition, food, water, cameras, extra gasoline, scientific instruments, and even the compass have been checked, for as one can see in the exhibit, the land is absolutely flat and all looks the same. Being lost in it has cost many a hunter's life.

Each Landrover was driven by a

professional hunter who has spent most of his life on big game safaris. Two or three expedition members rode the cab in front, while standing up in back, holding on to iron cross-bars, were African trackers whose incredibly sharp eyes scan the bush for new signs of the elephants which have been reported to be in the area.

On an average Kenya day, dawn breaks in breathless splendor on the equator. The expedition trucks drove eastward into the sun past the serpentine split-trunk Doum palm trees that lie like a line of sentries between the riverine forest and the bush country. Here and there, between the flat-topped acacia trees, each a billowy mass of creamy yellow blossoms, herds of oryx, delicate Grant's gazelle, thin-necked gerenuk and an occasional lesser kudu paused to look up before bounding for cover.

The change from riverine forest to stark thornbush elephant country is rapid and total. Thorn branches tore at the sides of the Landrovers. "Wait - a - bit" bushes, the cruelest of them all, because their thorns curve in three directions, reached out to slash the clothes and skins of the uncautious. The only semblance of a trail was that made by the elephants themselves.

Sometimes the trails are worn smooth and wide from thousands of years of elephant migrations over the same ground. Sometimes they are jolting tank-traps formed when elephants walk in the soft mud during the rainy season; this was the dry season and the footprints have hardened into concrete-like pits, some a foot deep, two feet long, and eighteen inches wide. The jolt as each wheel fell into a hole was bone-jarring; yet even this was easier than threading along, single file on foot.

In back, the African trackers scanned the limited horizon. Two Waliangulus, their faces deeply tattooed as the badge of their tribe, gestured from time to time in the direction of some animal only their keen eyes could see. They never spoke out loud . . . they were looking



Elephants in stampede

Crucial moment:
Telescoping elephant for
possible selection for
museum



for only one thing, fresh elephant sign in an area they knew the animals were hiding. From their years of tracking, they could tell you precisely how many elephants there were in a herd and in which direction they were travelling.

Suddenly one of the trackers leaned quickly over the side of the cab and tapped one of the hunters on the arm. A huge pad in the fresh dust showed that this track was made today. Silently the trackers slid over the side to the ground and melted into the bush. By now the sun was high and hot. The temperature hovered at 100 degrees. Only wisps of grass indicated the slight breeze. The silence of the bush was broken only by the distant call of a hornbill and far away, the chuckling sounds of a flock of Vulturine guinea fowl.

As quickly as they disappeared, the trackers returned. By hand signs and whispered Swahili, they indicated a medium-sized herd of elephants was not far away. One of them tossed a handful of dust and watched for wind direction as it settled to the ground. The vehicles drove in a wide semi-circle away from the wind, for an elephant, though weak-eyed, has excellent hearing, and phenomenal powers of scent.

For those who see the African elephants in the museum, it must seem incredible that this whole herd of animals in the wild could completely disappear from man's view in a matter of seconds . . . and do it without making a sound. One reason is that the elephants always reflect the color of the ground over which they travel. They stop constantly to blow dust over their backs. When at a water hole they scoop up quantities of mud from the bottom and splatter it over their backs.

In this country, much of the soil is reddish, and so are the elephants. Simple, you would think, to spot an animal the size of a small house, reddish grey in color, walking through the grey-green thorn bushes! This would be true but for one thing. The East African countryside is dotted with enormous anthills, some of

them as high as twenty feet. The elephants like to rub their backs on these anthills until eventually the hills become rounded and look exactly like elephants making their way through the bush.

The hunters in charge followed the directions of the trackers until they came to one of the Euphorbia trees that dot the horizon like huge spiny umbrellas. These trees give the only true shade to be found on this vast plain. In the heat of the day, the elephants often use them as a shelter. But to hunters, the trees are superb lookout towers, provided they can avoid their thorns and can keep from damaging the bark. When fractured, the bark literally squirts out a milky fluid that can nearly blind a man if he gets it in his eyes.

Perched precariously in the top branches of the tree, the hunters scanned the horizon with the binoculars. True to reports, they finally saw the backs of eight or ten reddish-brown elephants. They were moving slowly toward the southeast. It was time to go on foot.

A procession of men stalking a herd of elephant on foot, through the tinder-dry bush, carrying all the equipment necessary in case one of the elephants qualifies for the museum, is a sight to remember. A hunter with a gun was assigned to the three or four expedition members in the party. Straggling was forbidden for the reason that an enraged elephant, wounded or with a young calf, often centers its attention on a lone individual rather than a group.

Single file, without a word being spoken, the group turned and twisted through the dense bush. Out in front, an African tracker appeared and disappeared, giving hand signals that indicated clearly what the herd was doing.

Now fresh signs were everywhere. The tracks in the dust had been made in the last five minutes. The peculiar sweet-pungent odor of elephants was everywhere.

Suddenly the tracker held up his hand and stopped.

As if conjured out of thin air, a

herd of cows and calves appeared less than one hundred yards ahead. The Los Angeles County Museum of Natural History's taxidermist, George Adams, was hustled to the forefront of the group, where a hunter gave him his "best guess" figures about the size, weight of tusks and height at the shoulder of some of the best cows, especially those which did not appear to have calves at their sides.

This was the moment of extreme danger. The huge beasts swayed their heads from side to side. Their ears and trunks worked constantly trying to test the wind for some sound of danger.

Even though the wind was blowing from the elephants to the hunting party, there was always the danger of a wind shift. The decision to choose one from this herd for the habitat group had to be made in about one minute.

An old and very large cow seemed to fidget for a moment. One of her ears, as it flapped back and forward was shredded at the tip. Her left tusk, yellowed and worn with age, had had the tip split off in some past encounter. Perhaps she caught a glint of light from one of the cameras . . . perhaps she caught the very faintest of sound from the bolt of a rifle. She half turned. Instantly the whole herd was on the alert. Their trunks stretched out in the direction of the group. All heads were up. The ears were rigid now, at right angles to the heads. So far there had been no trumpeting. If a shot was to be made, it had to come at this instant, or everyone had to disappear back into the bush as quickly and quietly as they came, for there was still a good chance the elephants did not know what had caused them to sense danger.

The decision was automatic, for in a split second, the old cow decided she didn't like the look of things at all. With the calves milling about their sides, the rest of the cows began that half-dance, half-shuffle that accompanies their trumpeting when they are really alarmed. The old cow shook her head violently up and down with raised trunk and took

a single step forward. This could mean the beginning of a charge.

The hunters made a sweeping gesture that could mean only one thing. Step by step the party reversed its steps. Then, in a second, the lead cow made up her mind. She whirled into the herd with a great snort. The dust rose into a swirl as, in a chorus of shrill snorts and trumpeting, the herd turned with her and they were gone, crashing through the bush at a speed of 15 to 20 miles an hour.

They left a wake of smashed and trampled trees, plants, and grass that looked as though a fleet of trucks has just passed that way. They were gone, and they might not stop again for fifteen to thirty miles.

Later, when the excitement was over, it was learned that the one cow being considered for the museum had "crossed" tusks. While she was perfect in other details, the tusks had ruled her out.

So, it was back to the Landrovers again, tired, hot and thirsty. The encounter was far from a total loss. Valuable motion pictures had resulted and some stills had been obtained that eventually made the habitat group what it is today. Also, we had learned more about elephant behavior. After a few swigs of tepid water and a piece of none-too-tender guinea fowl, the party moved off to pick up a new trail and repeat the whole process over again.

Those two minutes of excitement . . . when expedition members faced the earth's largest terrestrial mammals, were moments of tremendous private satisfaction to all those who came so far to obtain the habitat group. It made up for all the heat, the insects, the humidity and the dust. For the naked power of a herd of African elephants, intent on self-preservation, creates a state of mind that must be experienced to appreciate to the fullest.

In fact, it can be the most overpowering experience in a man's lifetime. This feeling was expressed by several members of the expedition when, on March 29, 1963, one of the hunting parties was literally stampeded by some two hundred and

fifty bulls, cows and calves! Maurice Machris, co-sponsor of the expedition, was operating from a temporary camp near the Dakadema Hills in an extremely dry bush area of Northeastern Kenya. In addition to his own hunter, he was being guided by two Kenya Game Wardens who were doing some exploring for their Department.

For several days they had seen only a few small herds. At noon on the 29th, they were parked in the shade of an ancient Euphorbia tree for lunch. One of the hunters was, as usual, in the top branches of the tree. He passed the word down that there were several elephants approaching, but at a great distance. They continued to eat. With rising excitement, the word was passed down that there were at least twenty-five in the herd . . . then fifty. Then over a hundred! Finally, as he slid down from the tree, their hunter, obviously excited himself, stated that he couldn't count all the elephants.

The first hurried plan was to circle the Landrovers away from the direction the herd was taking, in order to approach it from the side. They were still looking for the large bull that today is the center of the museum exhibit. It became obvious at once that to single out this one animal would be difficult, if not impossible, with so many elephants in one herd. It was then decided to get as close as possible to the side of the herd and photograph it as it passed by.

They parked under a giant Euphorbia tree, where they expected to be safe but have a good view of the herd.

As with any well-planned operation, there's always the chance for miscalculation. An unforeseen error had been made earlier in the day when the party had momentarily stopped to examine fresh tracks at one of the numerous water holes that dot the area.

At that time, one of the trackers had stepped from the Landrover to the ground to get a better look . . . and the scent of man was in that soil. As they were soon to learn, the

entire herd was headed past that one water hole.

From the so-called "safe" vantage point beneath the Euphorbia tree, they watched the first of the herd begin to pass at a distance of several hundred yards. Mr. Machris put it this way:

"We were struck first by this truly inspiring sight, not so much by what we saw, as by something that was missing. Suddenly we realized what it was. Although the wind was blowing directly from the elephant toward us, there was not a sound, not the snap of a twig or the crackle of a bush. They passed by that silently.

"We stood atop one of the Landrovers. The other stood empty beside a nearby thorn bush. From our look-out point we were able to get some fair camera shots, but many of the calves were partially obscured by the thorn bushes, and there was talk of trying to move closer. Then, as though sparked by a single thought, we realized that the entire herd, for some unexplained reason, was standing motionless. Someone whispered, 'That water hole,' and we knew.

"Abruptly the still of the air was shattered by an overpowering chorus of trumpeting from bulls and cows, overlaid by squeals of the calves.

"The lead animals veered away from the water hole and its terrifying scent of man. This brought them into a straight line with our Landrover.

"How elephants communicate silently with each other is a mystery to scientists and hunters alike, but communicate they do. In a flick of an eyelash the entire herd of elephants, now estimated at over 250, galvanized into a true stampede, thinking, apparently, that the direction of the Landrovers was the way to safety.

"An enormous cow with calf, led the herd in a huge pulsating wedge pointed directly at us. On the Landrover, the hunters whispered urgent instructions to keep absolutely motionless and not to utter a sound. We were safe, one said, unless it be-

came necessary to kill one of the animals to avoid being crushed. Almost to himself, he added that few people have ever witnessed what we were about to see.

"These were not enraged elephants. They were in a frenzy of fear, travelling at a speed of from 10-20 miles an hour in a rising cloud of dust, punctuated by the heavy swishing thud of nearly a thousand heavy feet on the hard ground. In the first rush were the elephants that carried the dreaded man-scent in their nostrils. They did not smell us where we were. They did not see the Landrovers . . . and they **certainly** heard no human voices!

"Unaware that four elephant guns were trained on her heart, the lead cow and her calf closed the distance to us to 100 yards, then 50 yards and finally about sixty feet. Then she stopped. The thing she vaguely saw in front of her was not natural. She hesitated. Then she stopped, bel-
lowing loudly.

"The animals behind her had only one drive . . . to keep going. They split like a roaring flood and flowed past her and us in a torrent that left us an island in a sea of elephants. Finally she and her calf were swallowed up by the mass, but thankfully our island remained. The other vacant Landrover for some reason had become another spot which they left untouched.

"By rough guess, some 250,000 pounds of elephant meat 'on the hoof', carrying around 15,000 pounds of ivory, were to roar and trumpet past us within the next seven minutes."

Statistics, however, meant nothing in a stampede like that one. It was the limitless power that counted. It was the sight of a huge bull elephant, his ponderous weight of several hundred pounds of ivory jutting skyward, gleaming in the bright sun, his trunk curled upward as he trumpeted, that counted. For here were vivid authentic pictures, all recorded on film, from which the sculptor - taxidermist could reproduce a scene for the museum which perhaps fewer than a dozen qualified people had ever witnessed.



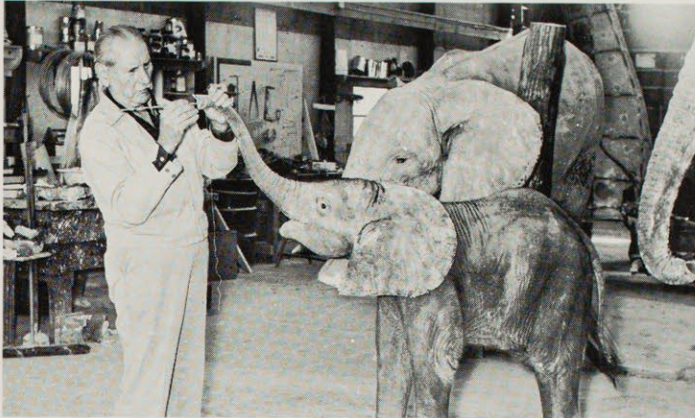
Cow with crossed tusks would be unsuitable for museum



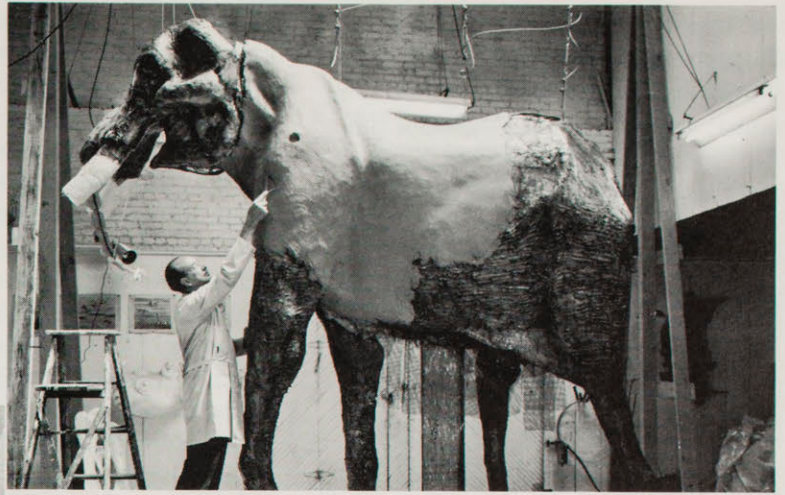
Stampede destroys everything in its path

TAXIDERMY AND SCULPTURE— KEYS TO NATURAL HISTORY EXHIBITS

by George N. Adams
Chief Taxidermist, Los Angeles
County Museum of Natural History



Louis P. Jonas making finishing touches on baby elephant
Taxidermist takes measurements of elephant prior to skinning

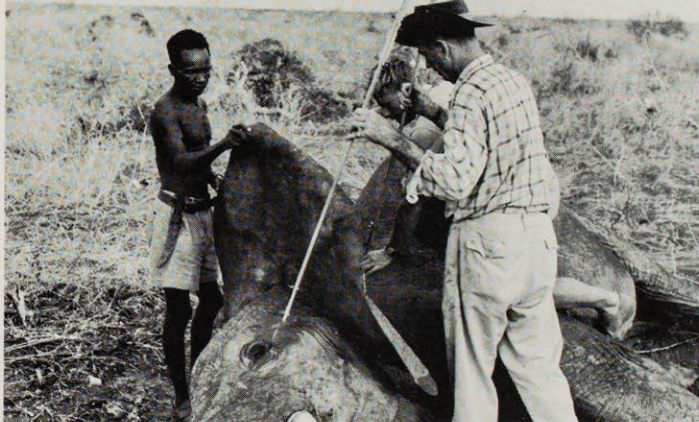


Clay model begins to take shape under hands of taxidermist, George Adams.
Canvas awning used to protect elephant during skinning process



Detail of elephant's eye

Every elephant skin is as different
as every human fingerprint



A young boy and his mother were studying a large mounted elephant. "How do they do it, mommy?" the boy asked. "They're stuffed with cotton, dear," the mother replied. Time was when taxidermy was just what the mother's answer implied—the practice of stuffing the skins of animals with straw. Taxidermy was derived from two Greek words—*taxis* (to arrange), and *derma* (the skin).

When man first became interested in the preservation of animal specimens in a more or less lifelike state we cannot say. A few brief accounts here and there give us a suggestion

that the art of taxidermy may have been practiced from remote times.

A story of Hanno, the Carthaginian navigator, for example, describes the discovery and capture of what were probably gorillas five hundred years before the Christian era; it states that the animals were killed and their skins taken to Carthage. Pliny tells us that these skins remained in the temple of Astarte until the year 146 B. C. When the Egyptian tombs of an even earlier period were opened, many embalmed cats, dogs, monkeys, etc., were found. This embalming was done to satisfy their religious beliefs and

cannot come under the heading of taxidermy because taxidermy properly attempts to reproduce specimens that are both true to nature and look alive. The Egyptian specimens were merely preserved bodies.

The first inkling we have of an attempt at mounting birds was in Amsterdam early in the 16th Century. Here the skins were arranged on wires and filled with spices to preserve them. Late in the same century we find mention of taxidermy in Shakespeare's *Romeo and Juliet* (Act. I): "I do remember an apothecary, and hereabouts a'dwells, which I noted in tatter'd weeds, with

overwhelming brows, culling of simples; meagre were his looks; sharp misery had worn him to the bones; and in his needy shop a tortoise hung, an alligator stuff'd and other skins, of ill-shap'd fishes."

The first publication on taxidermy was written in France in 1687; Germany, in 1778; Denmark, 1842; and London in 1831. The earliest publication of this kind to appear in the United States was in 1865. Taxidermy of the highest standards in the world has been produced here.

From these crude beginnings have evolved modern methods of taxidermy. A skilled taxidermist can reproduce an animal which lacks only motion as far as the human eye is concerned.

The form which the skin covers is modeled to resemble the animal's living body; the tense muscles, tendons, and surface veins are realistically reproduced. The art is so highly specialized that a mere knowledge of methods no longer spells success. It is essential to have an intimate knowledge of the anatomy and the habits of living animals.

Collecting the five elephants in Natural History Museum took much research in advance. The exhibit space was carefully measured for the placing of each animal. There had to be plenty of space between each specimen, as a crowded group would destroy the illusion of reality. The members of one family group are shown—a mature bull, two cows, a very young bull, and a calf of a few weeks. As a general rule museums do not attempt to show animals of world record size but choose specimens that represent the average of each animal type. Before going in search of the elephants, the positions of each animal had to be determined. The taxidermist then designed a 1/10" scale model of the proposed group that would, in its composition, create a pleasing picture as well as depict the animals in their everyday living habits. Animals placed at random in a group

portray a feeling of confusion and fail to convey the realistic impression for which the artist strives.

This habitat group was designed as a three-dimensional picture, to be balanced throughout, and contains one main center of attraction. In this case, it is a big bull shown in all of his majesty. The viewer will immediately grasp the traits of character of the elephant male. The other specimens are placed in such a position that they point up the male's importance. The curve of a tree trunk or the pose of the other animals has been used in such a way as to lead the visitor's eye back to the male. This has been worked out in such a subtle manner that one is not aware of it but is one of the things that causes a visitor to linger longer at this given group, thereby leaving a more lasting impression. It is important also to show different parts of the animal—the side of one, a back view of another. Art students, artists, sculptors and naturalists are aided particularly by this positioning of the animal because it does a much better job of teaching or telling a story. Visual education is the object of a habitat group—a lesson in natural history.

Preparing for and carrying out a collecting expedition such as the one which produced the five elephants in the Natural History Museum was a Herculean task. Authorities in Africa had to be contacted for dates, permits, etc., and professional hunters engaged. In order to be sure of delivery in Africa, it was advisable to ship all equipment and materials (casting plaster, tools, etc.) from Los Angeles long in advance. The usual tanners were contacted but it was discovered that this work had become so specialized, competitive, and in mass production by the use of machines that none of the concerns contacted felt they could handle the skins, since it called for all hand work and also they did not wish to shoulder the responsibility of caring for five elephant skins.

Bark tanning is desirable when preparing elephant skins for this method renders the skins flexible and permanent; this is basically the

form of tanning done for shoe leather.

Critical to the modern museum taxidermist are detailed and accurate measurements of individual animals taken in the field when the specimen is shot. The measurements are best made by the taxidermist who will be doing the mounting of the animals. He knows exactly where certain joints should lie in relation to other joints and to the body contours. The front legs of elephants are loosely attached to the body. Such facts must be known intimately prior to skinning so that an authentic model will result.

Ten-foot folding calipers were specially constructed for measurements such as shoulder heights. Outline drawings of all the elephants were made up by the taxidermist for all of the necessary points from which he wished to take measurements. In the case of the museum elephants, this was approximately every six inches over the whole bodies. Certain variables exist with all measurements. The taxidermist must consider the thickness of the skin, and the fact that muscles sag and are smaller when the vigor of life-giving blood and air ceases to circulate through them.

Color notes of the skin, eyes, etc., were taken. African elephants are usually brownish grey in color, but when they live in an area where the earth is red, their skins take on a stain of this color. This must all be restored when the skin is mounted, since it fades out in the tanning process. Because elephants throw water all over themselves while at the water hole and then scoop up red earth with their trunk and toss it up on their body, this condition is simulated after the elephants are completed by the taxidermist.

Plaster molds were made of different parts of the elephants. Eye, ear, and trunk areas were important; in fact, molds were made of skin textures at different points, as these disappear when skins are tanned, and were restored when the skins were fitted to the clay models. Numerous photographs were also taken.

With this information, his knowledge of anatomy, plus a lifelong study of the characters and habits of animals, the taxidermist attempts to create life-like models of the animals from bones, skin and hair. The illusion of life in the finished exhibit depends also on the natural setting of its habitat. Certain plant life does not preserve well; so are made up in plastics, paper, wax, etc., from plaster of Paris molds that have been made in the field. Water is made from glass or even beaver board which is colored and highly glazed, and with the many plastic resins available, it is possible to simulate practically any condition of water that exists in nature.

The elephants chosen in the field were carefully selected; many were passed up because of defects that showed up from observation through high-powered lenses. Elephants were found that seemed to be perfect material until a close study revealed the end of the trunk missing probably due to a native's snare. Others were observed to have giant festering abscesses in the skin from wounds received in fights or poisoned arrows.

After the elephant had been measured, photographed, and the plaster casts made, the removal of the skin began. Chalk lines indicated where the incisions were to be made, these being determined from the pre-planned scale model of the animal and its position in the group. Wherever possible, the incisions were made on a staggering line, so that when the skins were sewed up the seam was invisible to the viewer.

The neck was encircled back of the ears, joining the body incision at top of neck and on the throat. Short cross cuts were made across the opening incisions every four feet to make sure the various sections of skin would match when the skin was sewed together. The ears were skinned by making the incision on the back and two inches back from the edge, the back skin removed and the cartilage removed.

To prepare for all this, the author preceded the other members of the

expedition to Kenya by a month. From his headquarters in Nairobi, aided by professional hunters, he hired a large number of African natives known to be good skinners. At the Galana River area the Kenya Game Management was thinning elephant herds in an attempt to contain their overpopulation. These skinners were trained to remove elephant skins for taxidermy purposes. By the time the actual group of elephants were collected, these native skinners were quite professional, being able to remove the cartilage from the delicate ear skin without cutting holes in them. Many times, they sat up all night shaving the inch-thick skins down to one half that so that the salt could penetrate and bind the epidermis down. Much depends on this. The epidermis is easily lost, dependent, of course, on the condition of the animal, age, time of year, and later, to a larger degree, on the tanner.

Twenty-five-foot white canvas awnings were stretched on four poles to shade the specimens from the 110 degree heat and direct sun. The skins were resalted, dried, and dipped to protect them from insects during shipment to Los Angeles. Afterwards they went to the tanner for "relaxing," and further shaving to make them an even one-quarter inch thickness all over; then they were tanned.

Molds of the leg bones were made and artificial bones cast that were light enough to handle. Direct castings of the skull and pelvis were made and armatures set up over which to model the animals. Over this armature the life-size figure of the elephant was modeled in water

clay, and the skin, having been "relaxed," and moth-proofed in an arsenic solution, was fitted on the clay models.

Now began all of the effort involved in working out the details and wrinklins of the skins as they were on the living animals. Plaster was then placed over the skins and a framework of 2 x 4's fastened to the plaster. When the plaster had hardened, the body halves were separated and lowered to the floor, the armatures and clay removed, leaving the skins fastened in plaster. Dextrine mache and aluminum wire cloth were worked into the skins. Fibreglass cloth and rosin are also used in place of the wire cloth after a layer of mache has been placed in. Two by six timbers, the full length of the legs and body, were fastened into the legs with 18 inches protruding from the bottom of the feet to bolt the animals to their bases.

In the case of the large bull elephant this needed a second 2 x 6, one-third of the length fastened to the bottom part to make it more rigid. A month to six weeks was required for the mache and skins to dry in the mold. The separate halves were then raised and bolted together, working through a man-hole that had been cut in the lower torso and through the neck opening. The heads were raised in place and fasteners attached. The skins were then cleaned with a wire brush and shellacked to protect them against changes in the climate even inside the exhibit. Thin washes of color were applied to restore the skins to their natural shades. Finally the red earth was dusted on, and the animals were moved into the exhibit.



First step in habitat group: Positioning of clay models

Huge crane employed
to move elephant
into building



Nearly every child who visits the Los Angeles County Museum of Natural History has, at one time or another, struggled with model-making in the form of do-it-yourself plastic kits of intricate planes or ships. In fact, a number of them must have been among the crowd that assembled outside the museum in December, 1965, when what might be termed the largest do-it-yourself kit ever assembled passed into the museum through various doors and windows on its way to becoming a great new addition to the African Hall.

If there is anything that raises the blood-pressure of the modern animal-sculptor-taxidermist, it is to have someone call his finished work a "stuffed animal". In the old days that is just what they were. The taxidermist made a crude framework of metal wires and screening and then stuffed it full of rags, paper, excelsior or anything else that was handy and sewed the skin over that.

Today, the animals in a first-class natural history exhibit are true works of the sculptor's art. The skins are placed over fiberglass replicas of the animals after they have been sculptured in clay.

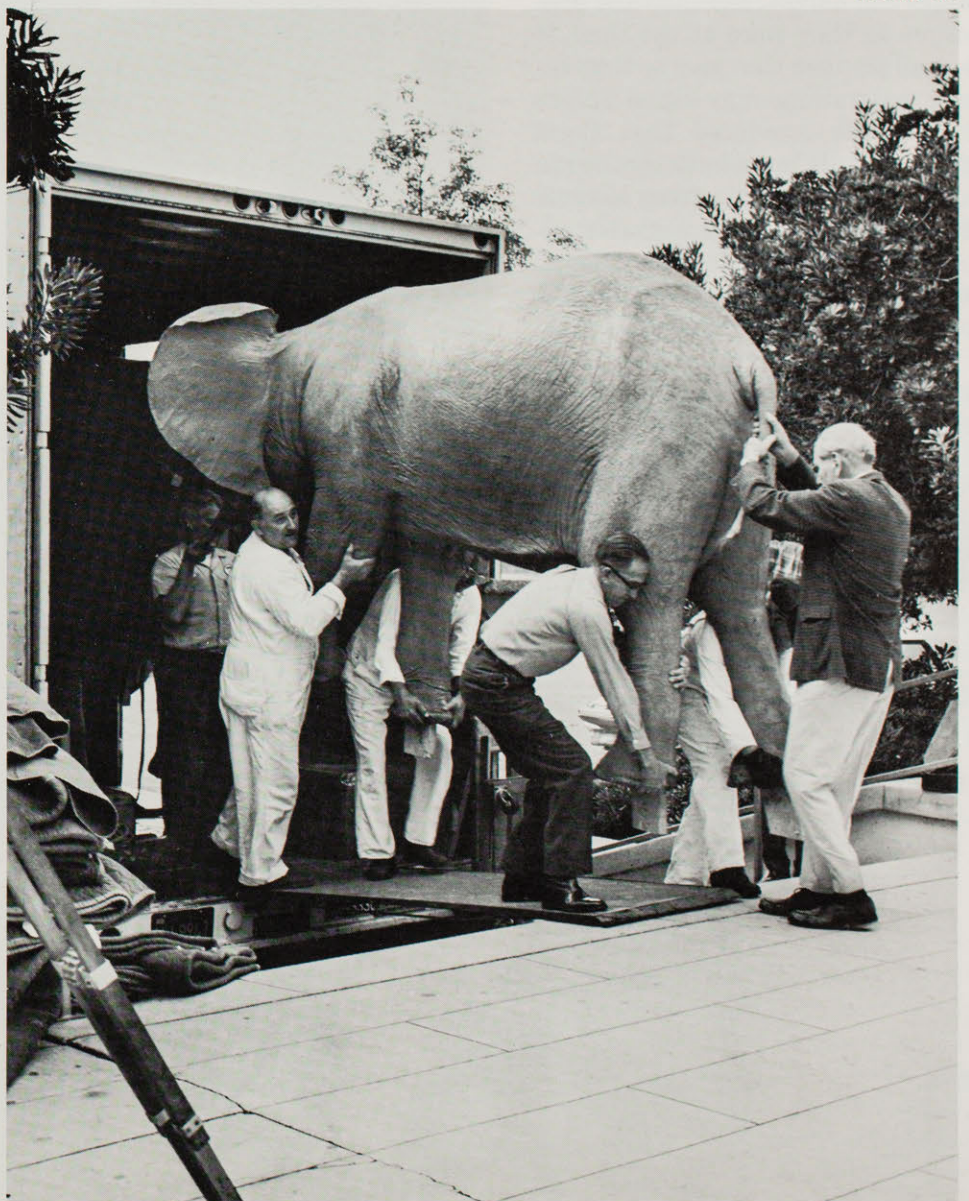
There is only one difficulty to working with large African animals. There is never enough room to spare in a museum when it comes to the actual sculpture. As with the elephants in the new habitat group at this museum, the preparation of the animals had to be done elsewhere. The large bull elephant was sculptured in Los Angeles by taxidermist, George Adams, on another part of the museum grounds; the other four in Louis Jonas' Studios in upstate New York.

All of this makes perfectly good sense, but also most of us can remember the story of the man who built a boat in his barn and then found out it was too big to get out of the door and he was left with the choice of tearing down the barn or cutting the boat in half.

Well, this didn't happen with the elephants in the habitat group at the museum, for from the very beginning, the measurements of every

MOVING DAY

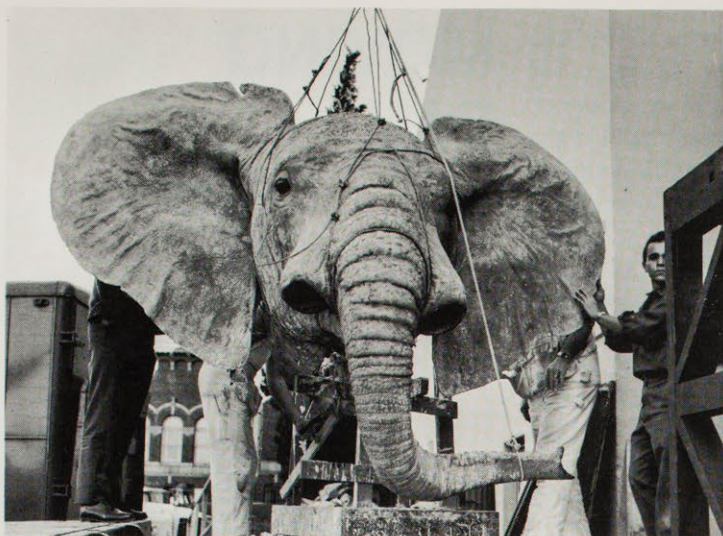
Removing elephant from moving van



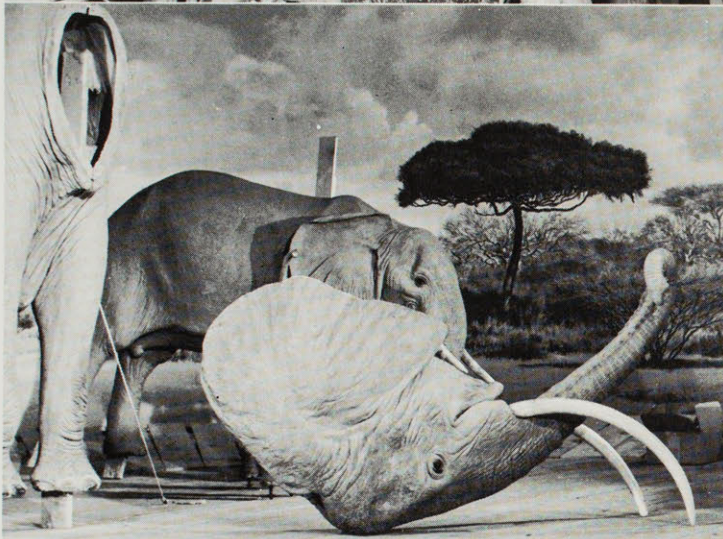
available opening in the museum were part of the master plan. Not only were the openings in the museum buildings a consideration, but also the method of transporting the elephants from New York to Los Angeles.

It is a near-comical coincidence that the Lyon Van and Storage equipment with its large African lion painted on the outside, was chosen as being most suitable for transporting the huge African elephants in a van that would assure their arrival at the museum intact. The accompanying pictures are a never-to-be-repeated historical record of just how difficult (if somewhat ignominious) an entry these noble beasts made into their new and regal permanent home.

Upside down and sideways, in pieces and halves; headless and grotesque as they were at the time, it was all planned that way so that future generations may stand before the exhibit convinced that these great animals must have strolled in one day and suddenly froze in their tracks. It is a truly remarkable example of art and science combined in a single coordinated effort that makes this museum what it is today.



Head of huge bull elephant with tusks removed



Animals had to be disassembled to pass through openings in building

Below: Crowd of school children are treated to sight of half an elephant



OF ELEPHANTS AND THEIR ANCESTORS

by Charles A. McLaughlin
Senior Curator, Habitat Groups
Los Angeles County Museum of Natural History

All elephants, both living and extinct, are included in a large group, the mammalian Order Proboscidea.

The name derives from the extremely elongate nose possessed by most of the extinct species. This muscular trunk serves the elephant in much the same way man's hands serve him in manipulating objects. We do not know whether all the extinct species of proboscideans had trunks, as soft parts are not normally preserved in fossils. The skeletons do show indications of muscle attachment and distortion of the area around the nose, which indicates that most had at least moderately developed trunks.

There have been considerably more than 300 species of elephants and their relatives during the history of this group. All but two of these species are now extinct. The first proboscideans appear in deposits formed during the Eocene Epoch, near the beginning of the Age of Mammals, more than 36 million years ago. Fossil remains of a small animal, called *Moeritherium*, were found in an ancient lake deposit in North Africa near Cairo, Egypt. Although we cannot tell

whether this early proboscidean had a trunk or not, most experts feel that its external appearance was probably more like a small hippopotamus than like the elephants of today. Its skeleton and particularly its teeth show conclusively that it was an early elephant ancestor. This animal was about two feet tall at the shoulder and was modified for life in swamps and marshes.

From this rather reserved start, the elephants have reached the enormous size we associate with them. Some of the extinct species of elephants were even larger than the largest individuals of modern elephants. The Imperial Mammoth reached a height of about 14 feet at the shoulders. Several other species attained similar size. The Imperial Mammoth once ranged over the southern portion of the United States, and the remains of many have been found in the fossil deposits at Rancho La Brea. The development of the tusks of the ancestral elephants reached many extremes, with some having shovel-like lower tusks, some having long curving tusks, some with four tusks, and many other variations. The

tusks of several of these extinct species were extremely long. There is a record of a woolly mammoth with a tusk length of 16 feet, 5 inches. This exceeds the greatest known length for modern elephants by some five feet.

Two major types of elephants, the mammoths and the mastodons, lived during the Pleistocene Epoch, which lasted from about one million to approximately 12,000 years ago. The mammoths were more like modern elephants than the mastodons, and their general structure, particularly their teeth, indicate that they are ancestral to them. The mastodons, which belonged to a separate family, were not as tall as the mammoths, had a more low-slung body shape, and held their heads more in line with the main axis of the body. Both mammoths and mastodons are represented in the Rancho La Brea fauna.

Before modern times, various species of elephants were found throughout most of the world, except in Australia, New Zealand and many other islands. The reasons for extinction of large segments of the elephant populations and the extinct

tion of the entire mastodon line are unknown. Let it suffice that all the elephants except those of two species found in the African and Asian regions died out. These species are the African and the Asian (sometimes called Indian) elephants.

Elephants are the largest of all living terrestrial animals. Only the basking and whale sharks and the whales exceed them in size today. Many extinct species of animals, including some relatives of the rhinoceros, have outweighed the elephants. However, no living land animals can challenge the elephants in size. The square-lipped rhinoceros and the hippopotamus must weigh as much as five tons in exceptional cases. This is little, however, when contrasted with the possible seven tons of a large male African elephant.

To support this tremendous weight requires great strength and careful engineering in the legs. When compared with smaller animals, the elephants' legs show one of the most important adaptations of the elephant to its heavy weight. The bones of the legs are directly in line when the weight is being supported. In this way the weight is carried directly through the bones on their strongest axis, like a column, while in most smaller and lighter mammals the bones of the legs may meet at an angle, with an extension of one bone extending the joint, as at the hocks of the hind legs. These angled joints and extensions of the bones permit better leverage for rapid locomotion, but allow for less support of weight.

The short legs of the hippos and rhinos permit better mechanical advantage for the muscles of the legs than do the long legs of the elephants. These large animals can move and stand easily with angled joints in the legs.

There are many differences in appearance between the African and Asiatic elephants. These differences may be rather obscure to people who are not familiar with these two related species, but the differences are actually as pronounced as those which separate the beagle from the

basset hound. The African elephants are considerably larger than their Asiatic counterparts. A large bull African Elephant may attain about 12 feet in height at the shoulders and over seven tons in weight, while a bull Asiatic elephant is rarely over ten feet tall and is usually under six tons in weight. The African elephants have extremely large ears which cover most of the neck and shoulder region when pulled back. Those of the Asiatic elephant are much smaller. The African elephant has a tendency to appear sway-backed in side view, with high points at the shoulders and hips, while the Asiatic elephant's back forms a smooth convex curve. The African elephant has a smoother forehead and carries its head high. The Asiatic elephant has two large lumps on its forehead and carries its head in line with its body.

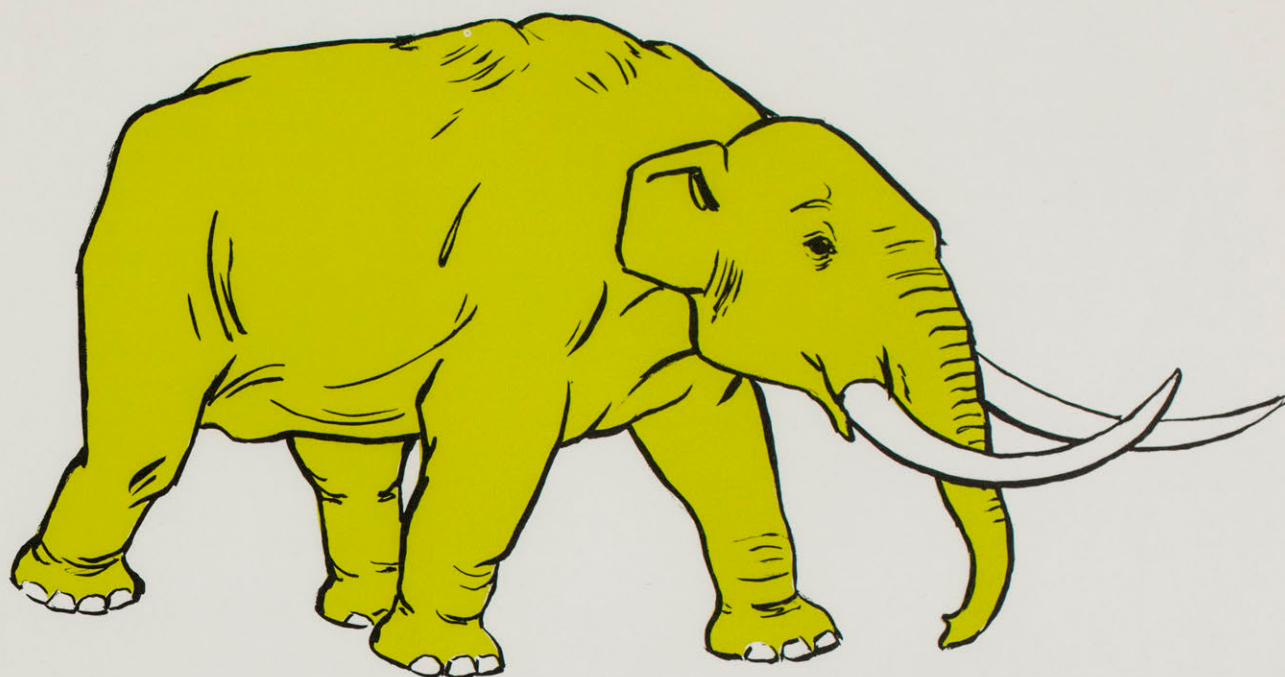
The most remarkable organ of the elephant is its trunk. This structure is the most extreme development of the nose known. It serves many functions, from that of sense organ to weapon. Probably its most important function is in obtaining and transferring food and water to the mouth. An animal of the huge bulk and height of the elephant, with its extremely heavy head, would find it very difficult to maneuver its head either to the level of the ground for drinking or grazing, or to the level of the tree tops for browsing. For either method of feeding it would have to have a long neck which would require greater muscular development than is mechanically feasible. With its trunk it can reach down to the ground and pick up food and it can reach up and pull it down. Frequently in feeding, the elephant will push over large trees in order to collect the leaves and tender bark at the twig ends with its trunk. Drinking water is pulled up into the trunk which is then raised to the mouth and its contents squirted in.

The trunk is a very sensitive organ of touch and is capable of very delicate movement. While muscular enough to push and pull over trees of considerable size, it also serves

the function of all good noses, detecting odors. It is particularly well adapted for this function because it can be used to sample the air from near the ground to nearly 20 feet in the air.

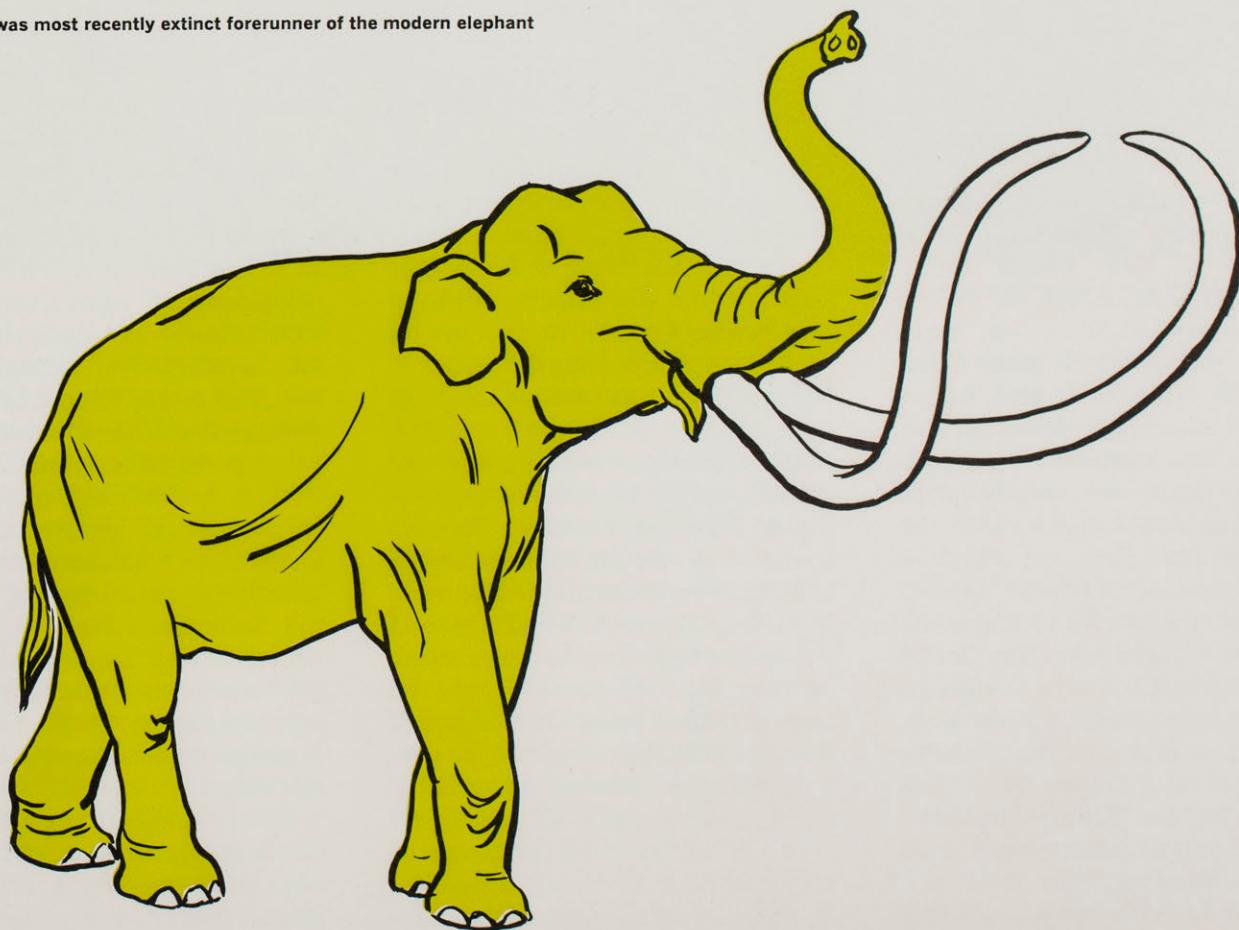
The teeth of elephants are highly specialized. In the case of the tusks it is rather difficult to determine the reasons for the development of such extreme enlargement. The tusks are greatly enlarged upper incisor teeth. They are made entirely of ivory, which is identical to the dentine layer of most mammalian teeth. The tusks are probably larger than needed by the elephants. They are used primarily in defense, and in sexual selection. Tusks of bull African elephants sometimes weigh more than 150 pounds each, with the largest size listed in Rowland Ward's **Record of Big Game** being a single tusk of 226 pounds and 10 feet, 21½ inches in length. As size of ivory is one of the prime factors in the selection of elephants for both hunter and poacher, animals with tusks of more than 100 pounds each are becoming increasingly rare. The tusks of the Asiatic elephant are only about four or five feet in length on the average, in the male, and extremely small or absent in the female. Female African elephants have tusks, but they are much smaller than those of the bulls.

The jaw teeth of the elephants are especially interesting. Their structure and method of replacement is unique among the mammals. Each tooth is made up of a series of flattened tubular plates of enamel which are "glued" together by a substance called cement. A single tooth, which may consist of over twenty plates in the Asiatic elephant and about ten in the African elephant, may be more than a foot in length and may weigh nearly ten pounds. Only one or parts of two adjacent teeth are in each side of each jaw, which means that normally four, or at most, parts of eight teeth are in the mouth at one time. The teeth are worn down at an angle at the front and grow in from the back. The teeth are replaced back to front like a miniature row of



Mastodon was one of 300-elephant-like creatures to precede the elephant in history

Mammoth was most recently extinct forerunner of the modern elephant



train cars. There are six teeth in each "train," so that the total number of teeth available during the entire life of an elephant is 24. The first teeth have the fewest number of plates, with each succeeding tooth being larger. When the last tooth is worn away and lost, the elephant can no longer chew its food and must die. This is one of the determining factors of the life span of the elephant, which approximates that of man.

The skull of the elephant is massive, but the weight is lightened by many cavities in the bone. The boundaries of the cavities in this foam-like bone gives great strength along with the lightness, while affording a great area for the attachment of the neck muscles.

Elephants have hair. In the adults, it is very sparse so that at a distance, they appear completely naked. However, the entire body is covered with isolated short stiff bristles. The young of both species have more hair than the adults, with the Asiatic elephant babies appearing particularly furry. Especially long and coarse black hairs fringe the tails. These hairs are woven into bracelets which are prized by both the local peoples and tourists alike.

Because of their heavy, leathery skin, elephants have been called pachyderms. This means thick-skinned. This name applies well to elephants which have skin more than one inch thick on many areas of the body. The name also applies to several other mammalian groups, including the rhinoceroses, which in ancient times were included with the elephants in a group called the Pachydermata. Elephant skin, in spite of its thickness and appearance, is very sensitive to touch and temperature, and contains many sweat glands. Like man, elephants perspire over their entire body surface as a means of maintaining body temperature below that of the surrounding air. Their skin, however, seldom appears moist even on the hottest days.

The elephant's color is caused by pigments contained within the up-

per levels of the skin, just as in man and other primarily naked animals. Occasionally pinkish albinos or pink-spotted partial albinos are seen, in which the pigment is absent from all or from isolated areas of the skin. The color tone of the animal may be strongly affected by accumulation of dirt on its body.

Elephants are gregarious. African elephants sometimes are found in herds containing as many as 400 individuals. The average herd contains about ten animals. A typical herd might contain a mature bull, one or two young bulls, and an assortment of females, with and without young. The larger herds are usually formed by the joining of many smaller herds during migrations in the more severe periods of the dry season.

Sexual maturity is reached at about the thirteenth year. The gestation period is about 18 to 22 months in length, and one young is usually born. Several other females from the herd may assist the mother during birth and may help with the care of the young immediately after birth. The mammary glands of the female are two in number, and are located between the front legs. A single female might be accompanied by as many as three young of different ages.

African elephants have been domesticated, but never to the degree seen in Asia. The Asiatic elephant may be slightly more docile than its African cousin, but the difference in the practice of domestication seems to be related to cultural and economic differences between the two regions, rather than to any psychological differences between the two species. The African elephant seems to have been domesticated as early in history as the Asiatic form, and was extensively used as a war steed, but the practice never caught on over extended areas or periods of African history.

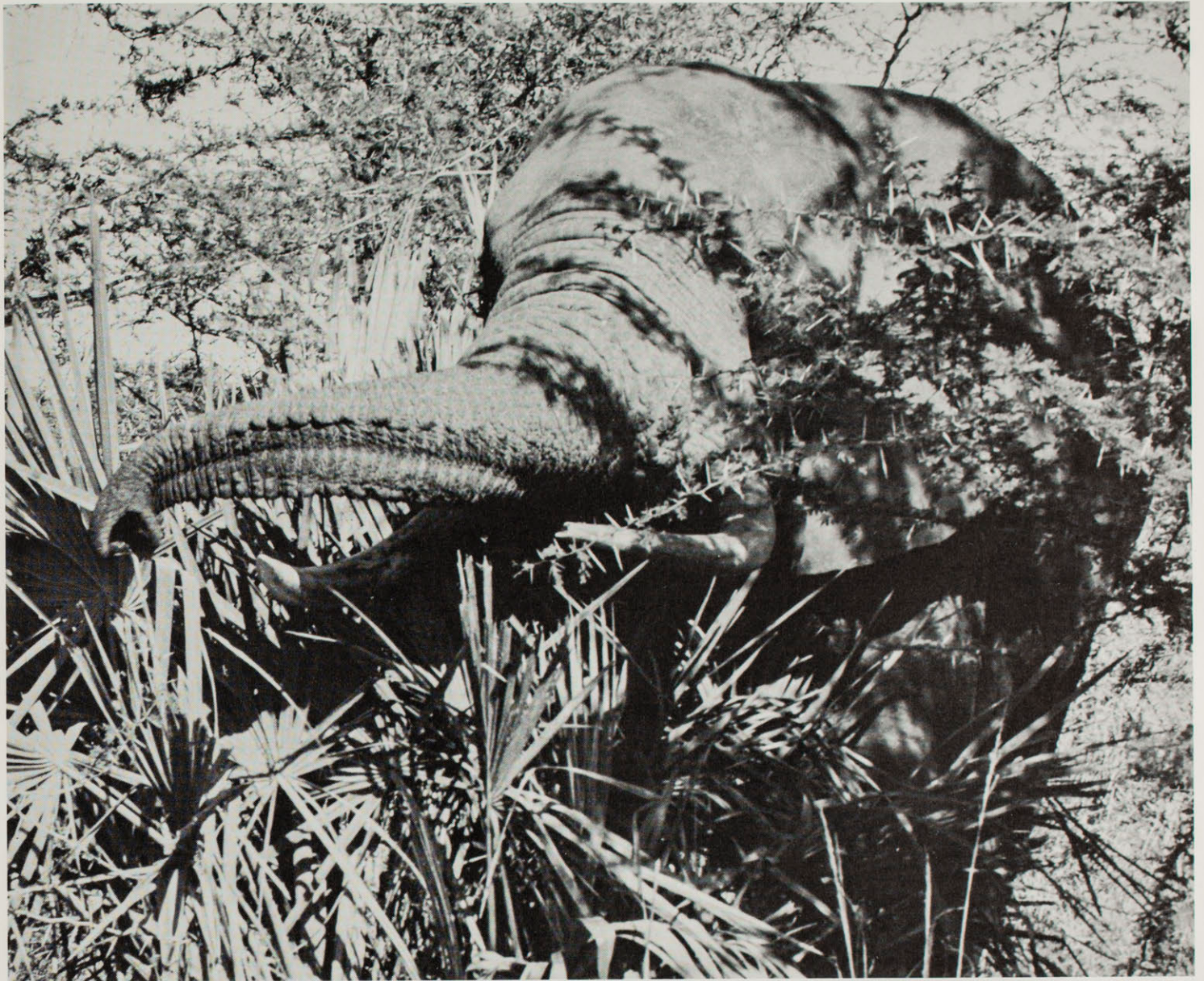
There are several geographic races (subspecies) of elephants found in Africa. Two forms are of major interest, as they are variously considered as species and subspecies, the Bush and the Forest

elephant. Those animals which inhabit the plains regions are called the bush elephant, and those of the forest region obviously the forest elephant. Most specialists feel that these two forms are actually races of the same species, as the differences between the two, such as a greater number of toenails both fore and aft (five and four instead of four and three), the roundish rather than triangular ears, and their smaller overall size seem to be only of a racial level of significance.

Another confusing name found in the literature is that of the Pygmy elephant. The description of Pygmy elephants is found in papers from various places and from various times. All seem to represent either young specimens, or individual specimens which have been stunted in their growth for numerous reasons.

The current and future status of the elephant in the wild of Africa is extremely doubtful. Current information indicates that the elephant will do well in various parks and refuges made available to it, under proper control, but is doomed outside these places of sanctuary. This also applies to almost all other species of African game animals. The major villain in the life of game animals will be the same in Africa as it has been in America, the development of agriculture. Where wild animals and agriculture come into conflict, the animals always lose. The problem faced by the bison during the 19th Century is now being faced by all game animals in Africa. As the land is taken over for agricultural purposes, the game animals are eliminated, for they are usually in direct competition with the farmers, either as predators which destroy the animals, as competitors for the grain and vegetable crops produced, or just as a nuisance for being around and stepping on things.

The economic interests of the individual citizens of Africa are at odds with the preservation of the game species on the open range. These interests will be victorious



The elephant's trunk is the most versatile appendage in the animal kingdom

over the greater interests of the nations themselves, to which the wildlife represents a valuable monetary asset, unless some means can be devised to gain general support for the preservation of the habitat and wildlife as a matter of national policy, coupled with the institution of some means of controlling the expanding population before it literally overwhelms nature with a need for food and shelter, at the expense of all the more spiritual values.

Elephants will be forced onto the reserves in spite of efforts to allow them to live elsewhere. They are now harassed outside the parks and will continue to be so in the future. They can be important friends to

the other animals, particularly during the dry season when they find water in stream beds and dig shallow wells for their own use, which are then left for the other animals. However, they are terribly destructive of habitat, particularly where their numbers are exceedingly high. This is what has happened in several of the parks set aside for wildlife in Africa. They have been forced into the parks without control of numbers, and having few enemies, they have reproduced themselves to a point where they have destroyed vegetation for themselves and the other animals.

Once the vegetation is gone, it takes a long time to replace it. An

area rendered unfit for supporting elephants in this manner is also unfit for most of the other herbivorous mammals. Because of these heavy depredations upon the habitat of the parks and refuges, it has been necessary to institute artificial control killing of elephants and other especially destructive mammals. These programs are not wholesale killing projects, but carefully planned cropping of animals to a safe level of population for themselves, the other animals, and the habitat itself. If habitat destruction is allowed to go too far, sun, wind and rain may make it impossible to reclaim the land for centuries.

THE ROLE OF SCENIC LANDSCAPES IN HABITAT GROUPS

It is the artist's handling of the scenic landscaping on the walls behind the natural history specimens which often make or break the effectiveness of the exhibit. The technique most desired is that the background become a two-dimensional extension of the plants and animals in the three-dimensional foreground. If the background painting is too "busy," it begins to stand on its own as a painting and detracts from the animals. If it is too bland, or if the proportions and perspective are incorrect, then the slightest flaws in taxidermy will become apparent to the viewer.

The number of topnotch background painters who are able to create the desired illusion of depth in a natural habitat exhibit is rare indeed. Carl Akeley was so insistent that the backgrounds be authentic for his exhibits in African Hall at the American Museum of Natural History that he took the famous artist, Leigh, with him to Africa in 1925, and the sketches were made on the spot.

Today, of course, modern photography, motion pictures and colored still slides can capture the essence of the landscape for all time.

Even so, the size of the habitat group at the Los Angeles County Museum of Natural History is so vast, 37½ feet high at the center and 116 feet around the arc at the back, that even the best of museum background artists were dismayed at the prospects, and at the length of time it would take to paint it. It was then that the name of Duncan



Duncan Spencer, background artist, has captured the essence of depth so perfectly that he appears to be standing in the middle of the African bush. Only his brushes and shadows prove he is only one foot from the scenic landscape.

Spencer was brought forward as the man to do the painting.

Duncan Spencer is one of five scenic artists who has spent the last 30 years painting the intricate backdrop scenes for the motion picture studios. He has worked in every major studio and his scenic backgrounds have ranged in size from a few feet for miniatures to a 600 x 30 foot painting of a desert scene in Twenty-Nine Palms, California.

Because of the needs of motion pictures, the techniques developed for this type of work are based on time. Where the ordinary museum artist might take three or four years to produce such a painting, Duncan Spencer completed the one in the present exhibit in six months.

It was his desire that visitors to the museum be given the illusion that the sky is in motion and that the flat back surface of the exhibit curve forward into a dome over the elephants' heads. Even the most casual visitor to the exhibit will marvel at how successful he was in accomplishing this.

Scenic backgrounds depend largely on the positioning of the horizon for their effectiveness. At the Museum, it was felt that because of the number of children, the average eye level would be lower than for most exhibits, which are attended primarily by adults. For this exhibit a height of 4'6" from the floor was chosen as eye level. This means that as one stands in front of the exhibit,

the horizon represents a distance of some three and a half miles from the viewer's eye. By a process of geometric calculation, the artist was able to create a landscape which is in exact proportion to the elephants standing in the foreground.

Field measurements indicated that the foliage of the trees and the bush where the elephants actually lived grows to a height of an average 20 feet. Having this figure, plus the measurements of the elephants' height as they stand in the exhibit, it then became possible by mathematical computation to re-create the natural background in an illusion of endless depth.

Much of the background — especially the sky — was applied with a spray gun. The details were applied with painters' materials that would shock the ordinary artist. Bundles of pipe-cleaners, bits of cloth, tufts of hair, and other strange materials were employed as brushes . . . for Duncan Spencer has discovered that such materials, when used in applying acrylic paints, add to the overall effect of depth.

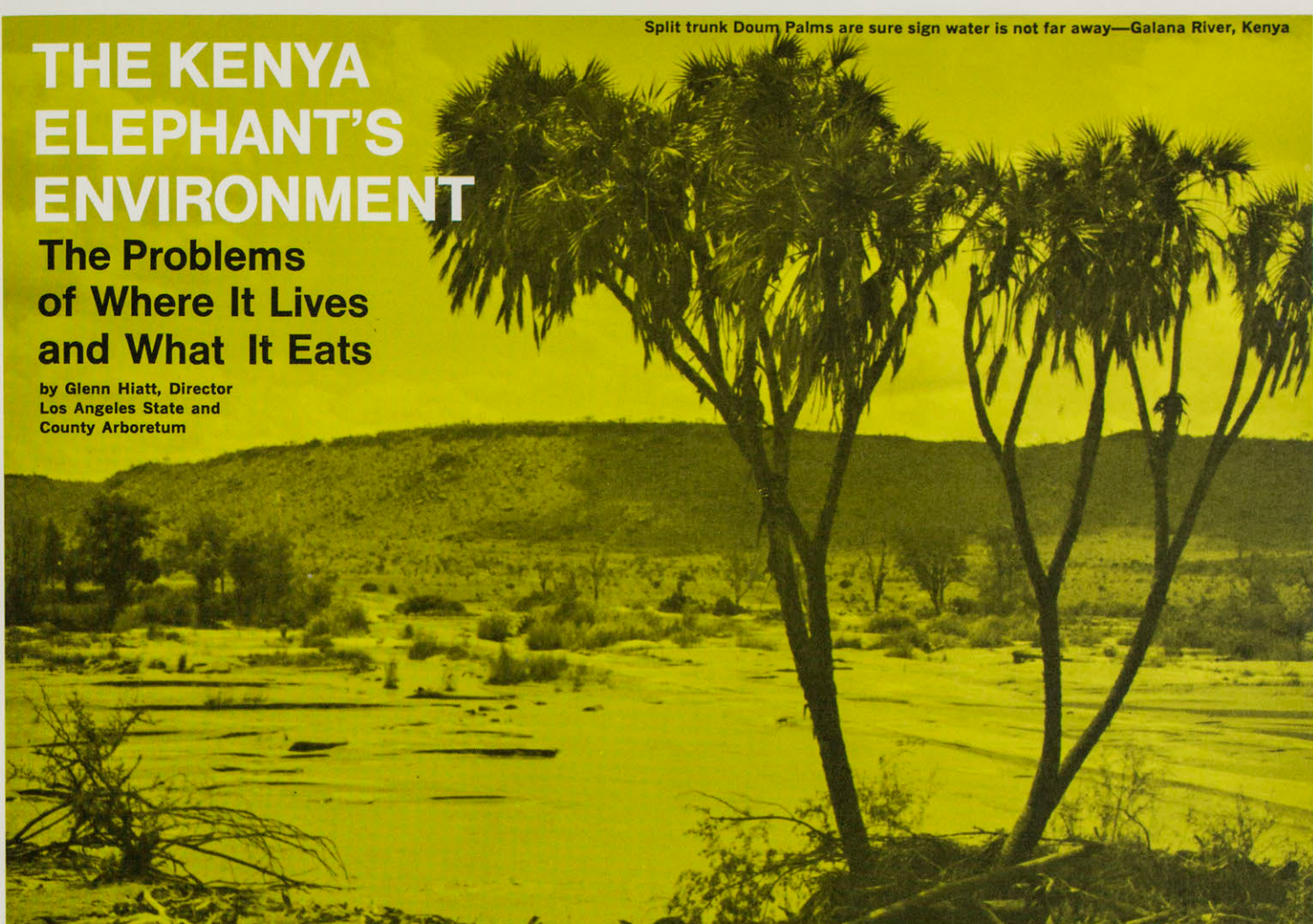
Since the exhibit has been opened, those fortunate few who have been to Kenya's elephant country in the past, have remarked that they experienced at once that uncanny sense of awe that one invariably gets when a herd of elephants appears silently and majestically out of the seemingly empty bush country.

Split trunk Doum Palms are sure sign water is not far away—Galana River, Kenya

THE KENYA ELEPHANT'S ENVIRONMENT

The Problems of Where It Lives and What It Eats

by Glenn Hiatt, Director
Los Angeles State and
County Arboretum



Visitors to the new natural habitat group of elephants and giraffe at the far end of African Hall of the Los Angeles County Museum of Natural History will be struck immediately by the sparse amount of vegetation surrounding the water hole scene. The reason for this is that the elephants in the exhibit were obtained in the Tana River area of Kenya where the normally wet and dry seasons are so contrasted that at some times of the year the countryside is a quagmire, a series of many water holes in shallow pans collected during the heavy rains; and yet the soil is so porous in this area that the rainfall is quickly absorbed and the terrain becomes almost desert-like.

What few people understand is that elephants have a great deal to do with the balance of plant life in many areas of Africa. The imbalance between the elephant populations and the plant material which constitutes their habitat is changing very rapidly in Kenya. As an example, Tsavo National Park, which

is composed of some 8,000 square miles of territory, now contains somewhere in the neighborhood of 15,000 elephants and as the human populations increase, the elephants which formerly ranged over large areas outside of the park are being forced for survival to congregate within the park boundaries. Take, for instance, the larger of the elephants in the new habitat group. They weighed, while alive, six to ten thousand pounds each and each consumed as much as 200 pounds of food per day. Elephants normally sleep for only short periods, perhaps four hours out of every 24. The remaining 20 hours are spent in continuous browsing and feeding.

The African elephant is particularly adapted for consuming practically all plant material. He can reach as high as 20 feet into a tree to pull down branches and with equal ease can remove the ground cover at the lowest level. The elephant's life seems to be just one long meal.

When it is realized that this food

consists mostly of the bush grass which can be seen in the exhibit, young tree branches, leaves, bark, palm shoots, bushy ground covers, and herbs, it is understandable that it is most difficult for these plants to re-establish themselves after a rainy season fast enough to supply this constant, voracious appetite of the thousands of elephants which are undergoing a population explosion.

As the visitor stands before the exhibit, he is seeing an exact replica of a section of the Northern Frontier province of Kenya where the Knudsen-Machris Expedition collected these animals in March of 1963. It is the end of the dry season. Typically, the elephants have remained near the water hole during the night and as the lighting indicates, it is now between 9 and 10 in the morning. The elevation of the land averages 1500 feet. It is almost completely level ground with few exceptions, such as the water hole in the exhibit which represents a shal-

Where gallery forest
on Tana River turns
to open bush
country. Split-trunk
Doom palms produce
a nut which is
favorite food of
elephants. Thick
bush below palms
is locally called
"toothbrush tree."
Natives clean teeth
with its fibre.



low pan in which the water remains because of the constant pressure of the weight of elephant feet which have packed the soil. The depression in the ground is maintained by elephants scooping up mud and squirting it over their backs as protection against the sun.

The remarkable background mural behind the exhibit is authentic in every detail, being geographically and botanically accurate. This is called savannah forest or bush savannah and it is the type of land which covers nearly two-thirds of Kenya.

Under normal conditions, the plant life in these areas varies tremendously in composition and distribution and often changes from one season to the next depending on the quantity of rainfall. It is made up of clumps of medium-height spreading thorn trees, along with stunted shrubs and dense patches of bush grass. The trees, subjected to such extremes of temperature, drought and heavy rainfall, show a great ability to adapt themselves to such conditions. Most have large quantities of fruits or seeds, many of which are retained on the trees for months or even years. Many of them have tremendous fire-resistant coatings.

Even so, from the moment of germination from a seedling until its eventual growth into a tree, it is subjected to a precarious existence. Consider a few of these examples: constant cropping by animals, hordes of insects which devour the leaves, frequent fires, and severe periods of drought, all of which take an enormous toll. Yet nature has provided the savannah bush with a

bark which is thick and cork-like. This increases as the trees grow to maturity.

The plant life of the savannah appears to have more highly developed self-healing qualities than many other places in the world. It has even been noted that trees completely ringed by elephants stripping the bark, are able to reconnect the cuts with new tissues while still continuing to produce their seasonal foliage.

Dominating the background of the savannah, or veld, are clumps of trees and bushes, many thorny. **Commiphora-Acacia** mixed woodland predominate, but occasional larger trees, such as **Delonix elata**, **Melia leokensii** and other flat-topped acacias create accents on the horizon. Mrs. Valley Knudsen, who accompanied her late husband on the expedition, was especially fascinated by bushes covered with two-inch diameter black pods surrounded by thorns, and completely covered by ants. These were determined not to be safari ants but were very small and black. Elephants would pick up the pods in their trunks, and eat them—apparently ants and all! This example illustrates the extraordinary variety of diet of elephants.

The extent to which the elephants control the plant environment of the savannah bush is largely based on the fact that they can travel farther in one day than practically any other animal, so that the scope of their foraging, with the emphasis on new growth, obviously results in a scarcity of food for all the other animals which share the same territory. When the elephant popula-

tion gets out of balance because of a population explosion, it is the elephant that is the last to suffer. Herds of elephants have been known to travel as far as 60 miles in search of the nuts of the Inkoma or Doom Palm, **Hyphaene coriacea**. These nuts are three-inch discs covered with a hard, sweet rind and mature between July and September. At other times, they will travel an equal distance to invade the commercial sisal plantations which is a major crop in Kenya and is used in the production of hemp.

Family groups of 16 to 20 elephants, including several generations, traveling with a herd of up to 200, push through entire forest areas, uprooting shrubs, pushing over trees, and munching bushy ground covers and herbs. Since elephants are very rough feeders, they spoil much more than they eat. It is now estimated that each elephant, because of this wasteful habit and never-satisfied appetite, requires from one to two square miles of munching territory for support.

Researchers for the Kenya Wildlife Society have observed that a normal elephant selects his diet from 28 or more botanical families, browsing some 60 to 70 species, varying from hard twigs, up to branches two inches in diameter, to leaves, pods, flowers, and grass.

It has been estimated that good meadow grass hay contains just over 11% crude protein, 31% crude fiber, .82% calcium, .2% phosphorus, and 1.54% potassium. Observations showed that the composition of the elephants' diet in one day corresponded closely to these proportions, although higher in total calcium.



Lone bull elephant
in area where
elephants have
destroyed all
vegetation but grass

From all of these facts, visitors to the Museum should be able to understand that, while at present there is an overpopulation of African elephants, their future in centuries to come is in doubt, and scenes such as the one depicted in the habitat group may disappear forever as human populations expand and the elephants are forced into smaller and smaller areas.

The big question presents itself: Can the elephant adapt itself to a change in habitat which it created itself? It has already learned to live in semi-desert country which it never before occupied. It has learned to live up to 15,000 feet in elevation, in bamboo forests which were never its normal home.

Of course, it is not the elephants alone which destroy so much of the plant material over wide stretches of the areas they roam. It should be remembered that much of this territory is inhabited by nomadic tribes with huge herds of scrub cattle which eat the vegetation down to the roots. The native people are dependent for sugar largely on the honey of wild bees, and to obtain this honey, start fires to smoke out the bees. They have little regard for the effects of the fires and let them burn uncontrolled. This is also true of poachers who often set fires to drive game into traps. After such fires, the regeneration of the natural bush is a very slow process and the spread of grass is a natural aftermath of burned-over areas.

It is, of course, a fact that elephants will normally eat large quantities of grass for food but they prefer foodstuff with more woody con-

tent. Grass has only reasonably good food value when it is green during or immediately after the rains and very little value to an elephant when dry.

The more important grasses include *Chloris myriostachya*, *C. gayana*, *Cenchrus ciliaris*, *Panicum deustum*, *P. meyerianum*, *P. maximum*, *Dactyloctenium giganteum*, *Brachiaria deflexa*, *B. leersioides*, *B. serrifolia*, *Arispida* sp., *Eragrostis* sp., and *Tetrapodon* sp.

Since the large expanses of grasslands have in recent years replaced the bush and scattered large trees, what changes can be taking place in the elephants' diet that will affect its habitat, health, and even survival?

It has been suggested that game animals convert their food into protein in a more efficient manner than domestic animals. When grasses disappear during periods of drought, trees and shrubs maintain a relatively high food value. During long dry seasons, much of the most nutritious food is provided by the legumes, herbs and woody vegetation.

Since it is a fact that the elephant is rapidly changing his diet habits by the very fact that he is eating himself out of trees, thus becoming a grass eater, he must eat twice as much as he would have normally eaten before. It is also a fact that the animals must drink from 60 to 70 gallons of water per day. To obtain these vast amounts of grass and water suggests that his normal daily travel will carry him 30 to 40 miles in search of such food and water.

Strangely enough, with the almost totally omnivorous vegetarian diet of the elephant, there are some trees and shrubs in the savannah forest which appear to be untouched by any animals. Maurice Machris, who led the expedition which collected the elephants, has observed *Salvadora persica*, locally known as the "Tooth Brush Tree", growing in large quantities in many areas of the Northwest Territory near the Tana River in Kenya where the elephant group in the exhibit was collected. This is a small, many branched, whitish stemmed tree or shrub normally growing to 15 feet. Its principal value to man is what gives it its local name, for when the natives break off sections of the branches, the unusual structure of the wood allows chewing for long periods of time without destroying the fibre; this may be of dental cleansing value, for the nomadic people who live in this area were observed to have exceptionally white teeth, unmarred by decay.

All in all, the ultimate stability of plant species in their natural habitat and plant association is termed a botanical "climax". This is usually regulated and influenced by a combination of elevation, environment including local climates, wind drift, rain and even pockets of fog, or hot burning sun. It is an equilibrium of plant species in nature that exists only when all of these conditions remain approximately constant. It appears now that this situation can become permanently altered by the overpopulation of elephants with their massive destruction of this "climax" of plant vegetation.

Habitat group in final stages of completion.



FOSSILS ARE FOR DIGGING

by J. R. MacDonald
Senior Curator of Vertebrates



"Dig we must so our City May Grow" is a sign often seen on street barricades in New York City. "Dig we must so our Museum May Grow" is an equally valid motto for several sections of the Museum.

During the past several years the Vertebrate Paleontology Section has been moving large amounts of dirt and rock at a number of places to obtain specimens for display and study at the Museum. Large holes have been dug at Atotonilco el Bajo, Sayulo, Zocoalco, Hell Creek, Wounded Knee, Prudential parking lot, No-flesh Creek, Bear-in-the lodge Creek, Sharktooth Hill, Anza Borrego, Laver Cake, Circle C Ranch, Hell Hollow, Big Spring Canyon, and many other places with equally romantic names.

The people who must pay for these excavations—sometimes the taxpayer, but often a patron of the Museum—will ask, "Why do you have to go out of the County or even Southern California to get your fossils? There must be many fine fossil localities right here that can be worked with less expense."

Then there are those who will ask if you enjoyed your vacation when you drag into the Museum after a two or three month absence. This tends to rouse one to violence because the "Vacation" has always consisted of fourteen-hour work-days for seven days a week in some hot and dusty, hot and wet, or just plain hot place. Don't get the idea that we don't enjoy the work; if we didn't, we wouldn't be here, because the monetary return for this work is peanuts compared to jobs in education and industry.

Like gold, fossils are where you find them. To adequately tell the story of the development of life and to present interesting exhibits to the public, we must go where the right kinds of fossils are to be found. Here in the Los Angeles basin we do have wonderful fossil materials. Rancho La Brea, now Hancock Park, has produced the most complete record of late Pleistocene life known to science. The rocks of the Palos Verdes Peninsula and the Santa Monica Mountains produce

fossil whales, birds, sea lions, and fish in large numbers, and the Pleistocene stream gravels and flood plain deposits of the basin contain many things comparable to Rancho La Brea. This is not enough to present the history of life to the museum visitor because it is all of one relatively recent geologic period. If we were to show only the things available locally, the Museum would quickly lose the extent of its educational value.

Let's consider dinosaurs. Every school child knows of dinosaurs, and almost every museum visitor wants to see one. The dinosaur record from Southern California consists of a few teeth. The record for all of California adds only two partial and imperfect duckbill skeletons to the record; these were collected in the Panoche Hills in the west-central San Joaquin Valley. The best of these two skeletons has been prepared as a slab mount for exhibit. It will show "The California Dinosaur," but if this were to be the total of our dinosaur material, we would be a pretty poor museum. Actually, we are going to have a spectacular dinosaur exhibit; in fact, it has the potential of becoming one of the best in the world with continuing support from patrons like Mr. and Mrs. William T. Sesnon to support our hunting.

Our Jurassic dinosaurs, **Brontosaurus**, **Antrodemus**, **Camptosaurus**, and **Stegosaurus**, were obtained on trade from the University of Utah. They were excavated in central Utah by the University, at their quarry where many skeletons were found. This was a unique situation and fortunately did not call on our staff's time to excavate the bones nor to do the basic preparation. This would have taken six or seven man-years. As it is, it is taking an average of two man-years to mount the smaller dinosaurs, and when we start the *Brontosaurus*, we will plan on a minimum of three to four man-years for the mounting and fabrication of missing parts.

The Cretaceous dinosaur situation is quite different. One common duckbill was obtained by trade from

a Canadian museum that has a surplus of these central Canadian forms. The California duckbill was collected in the 1930's by field parties from the California Institute of Technology and came to us when the Museum acquired the Cal Tech Vertebrate Paleo collection. At this point the dinosaur acquisition comes to an abrupt halt. We have traded for all the dinosaurs we can; from now on we are on our own. To continue to obtain a representative collection of Cretaceous dinosaurs, we have to go where they may be found. Readers of the Quarterly know that the Sesnon Dinosaur Hunt is in "full cry," and that we are working on this problem.

We are searching the dinosaur-bearing beds of Montana and neighboring states for a **Tyrannosaurus**, the primary objective of the Sesnon Dinosaur Hunt, but so far we have obtained a mountable skeleton of a very large **Triceratops**, as well as another partial skeleton and skull seven feet long. In addition, a probably complete skeleton of a juvenile *Trachodon* and the tail of a large duckbill were found and reburied for excavation this coming season. We hope that other sorts of interesting dinosaurs will come to light during the course of this project. Finally, our current joint venture with the National Geographic Society in Baja California may also yield mountable Cretaceous dinosaur skeletons.

A complete blank in our dinosaur story is the 45 million years of the Triassic period—the first part of the age of dinosaurs. The search for material from this age must be made in the southwestern United States, in Arizona, Utah, New Mexico and Texas. Some day, when we have a Curator of Fossil Reptiles and Amphibians, this great gap may be filled. The task is of a magnitude requiring a full-time curatorial specialist to direct the work.

In other fields of Vertebrate Paleontology, we are doing fairly well in the exhibit line; at least we have enough material to fill the presently allotted halls. However, if we are to try to present a comprehensive



A 6,000,000 year old Pliomas-
todon skeleton being excavated
near Beaumont, California.

story of the development of the mammals, a great deal of field work and additional exhibit space will be needed.

Another side of the Museum coin is the Museum's research projects. A museum's reputation for greatness is not built on its exhibits and special shows alone but on its reputation as a center of scholarly endeavor and research. In Paleontology, we are slowly putting together the history of life as revealed by the fossil record. This record is broken and incomplete in many areas as the result of the destructive geologic processes, or because a given area was a region of erosion during a particular time so that no record could be preserved in a series of accumulating sedimentary rocks.

Here in Southern California, we are faced with a difficult problem with regard to interpreting the history of mammals. Our record is quite incomplete, although we do have some excellent fossil localities. In order to properly study what we do find, we must go to the deposits of the Rocky Mountains and the Great Plains for comparative materials. In those areas, the sequence is well preserved and, in general, well known. If we are to expand as a center for the study of fossil vertebrates in Southern California, collections from these areas must be made; they are the basic references for future studies by the mammalian paleontologists.

Another unique opportunity available to us is to explore the virtually untouched fossil faunas of Mexico. In cooperation with the Mexican authorities, we have the facilities to support each other in the development of vertebrate paleontology in Mexico. In the past, Mexico has rightfully been basically concerned with its magnificent treasures of archaeological material. Now that country is in a position to move along in vertebrate paleontology. Already this Museum has been fortunate enough to have been permitted to work in the Lago de Chapala area, where we have a continuing interest; and we are currently working in Baja California in



A Rancho la Brea type deposit in a sewer ditch at the corner of La Brea and Sycamore Avenues, Los Angeles.



A juvenile mammoth, bogged in the mud a quarter of a million years ago is uncovered at Atotonilco el Bajo, Jalisco, Mexico.

conjunction with the National Geographic Society. This Baja California venture may develop into one of the most interesting paleontological projects in many years. Preliminary parties not only found dinosaur remains, but parts of animals from the beginning of the age of mammals, including the first record of the tiny dawn horse, *Eiohippus*, to be found west of the Rocky Mountains.

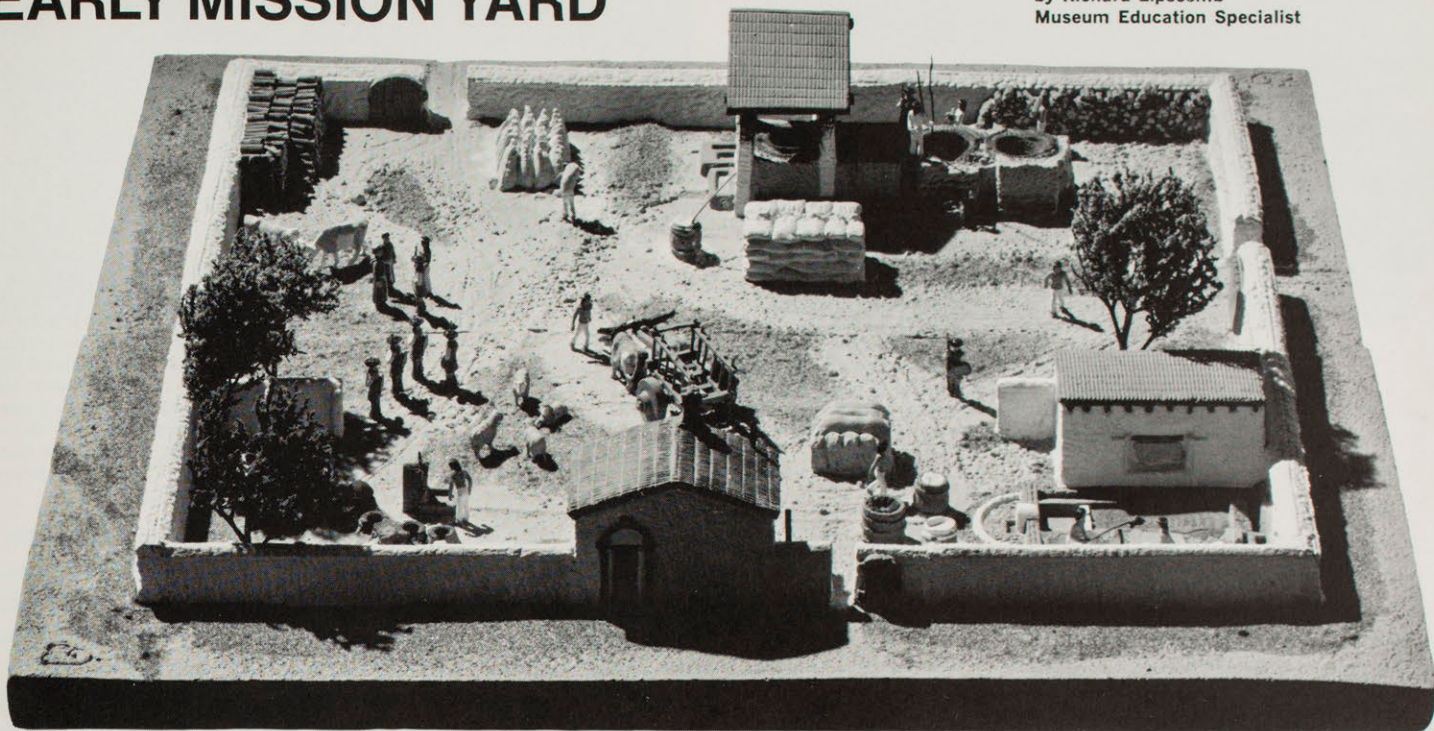
The people of the Los Angeles metropolitan area expect their Museum to be on a par with the greatest in the country. Field programs are an absolute necessity to help achieve this goal. Therefore we must continue to dig and send field parties to places with names like Eagles Nest Butte, Oaxaca, the corner of La Brea and San Vicente Avenues, San Josecito, Keya Paha, Laguna Hills, Red Shirt Table, Stronghold Table, Red Dog Table, and San Juan Capistrano.



Sharktooth Hill in Kern County, California constantly produces important records from the sea that covered parts of Southern California 25,000,000 years ago.

LEATHER, CANDLES AND SOAP— BIG BUSINESS IN AN EARLY MISSION YARD

by Richard Lipscomb
Museum Education Specialist



In 1930, while excavating the roots of a tree in the San Gabriel Mission yard, workmen came upon masonry work. When the dirt had been thoroughly removed, there was revealed the most perfectly preserved series of pits for tanning leather to be found at any of the California missions. Further excavation nearby brought to light the Mission's soap factory, consisting of four open ovens, where fats were rendered in the production of soap and tallow for candles.

These evidences of mission industry had been purposely covered over, probably when the mission was secularized; the secularized mission operated merely as a parish church rather than as a full-blown experiment in early communal living.

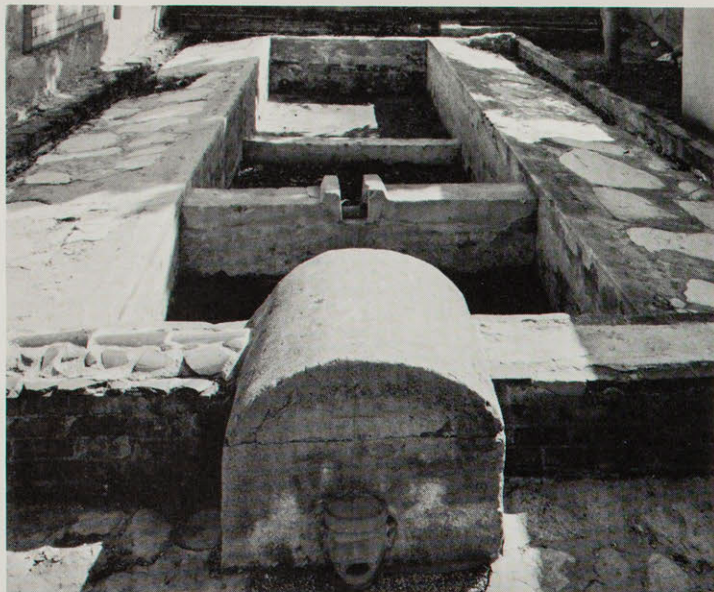
The chief sources of mission revenue were their traffic in hides and tallow. In fact, the total mission economy was based on export of these two items. While the mission population itself had great need for the hides, soap and candles it could

produce, the outside world demand for these goods dramatized the importance of these Missions.

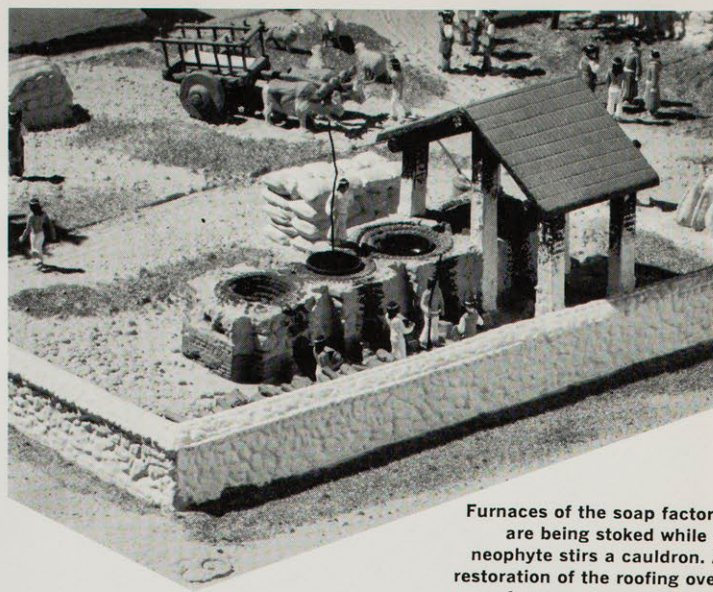
This was no small business. Mission San Gabriel's cattle herd was at various times estimated as exceeding one hundred thousand head. From this bounty the Mission neophytes, under their Indian mayordomos, were kept busy attempting to supply hides for the numerous Spanish merchant ships that put in at San Francisco, Monterey, Avila, El Cojo, Santa Cruz, Santa Barbara, San Buenaventura, San Pedro, San Juan Capistrano and San Diego. Under Spanish regime, all trading with foreign vessels was strictly prohibited and even Spanish vessels were forbidden all but certain prescribed articles. This was all in accordance with the Spanish Government's desire jealously to hold the land free from any foreign infiltration—and to hold it as cheaply as possible by encouraging self-sustaining Missions to convert the Indian population for religious and Spanish unity.

After 1798, however, word leaked out about the potential riches of California, and trading vessels of English, Yankee, French and Russian register hawked along the coasts in ever-increasing numbers. To the Missions and colonists these visits were welcome, since Spanish California needed almost everything in the way of manufactured goods—and Spain showed complete disinterest in supplying these wants. It is little wonder that smuggling became an accepted way of life even among the most churchly of the religious fathers. The missions could pay for the cargoes brought them with hides and tallow and although the Spanish laws were not changed, the necessary accommodations were openly made so that by 1816 the laws were a dead letter.

Tallow, candles and stored untanned hides were the big trade items; very few of the tanned hides from the Mission tannery were traded. The eventual purchasers of the hides, whether merchants in Boston, London or Lima, Peru, pre-



The excavated tannery vats at San Gabriel Mission. The partitions that divide this main pit into three compartments can be clearly seen. The deep catch pit can be dimly seen at the right rear of this main pit. The wall of the drying shed is at the left of the main pit.



Furnaces of the soap factory are being stoked while a neophyte stirs a cauldron. A restoration of the roofing over one furnace shows what formerly existed over all four. Furnaces are spattered with lime to keep flies away. Just beyond the furnaces is a day's supply of fats to be rendered. To the right other leather bags, upstanding, contain tallow.

ferred to do their own tanning. After a simple but laborious process of cleaning and preserving by immersion in a strong brine solution, the hides were dried in the sun and then carried aboard ship. Later, they might again return to California as shoes or other manufactured goods.

The tannery at the Mission was primarily for local needs and demand for leather was so great that the tannery never quite supplied enough.

In the process of tanning, as each animal was slaughtered it was drawn aside and skinned. The hide was then staked out flat on the ground by Indian helpers and left to dry, after which it was taken up and folded down the middle, skin side up, and carried to the Mission. Hides to be stored for barter with the merchant ships were given a rudimentary cleaning and a dousing of salt solution to prevent spoilage. Cattle were slaughtered regularly to feed the Mission family which at San Gabriel variously included an Indian population of between 2,000 to 2,500 persons. "Green" hides could go directly to the tanning vats and were joined by others from storage which had become "stiff as a board" and required soaking first in clear water to soften

them and remove the salt in which they had been preserved. It required many changes of water to remove all the salt and, between times, the hides were laid out on the smooth stones surrounding the tanning pits and scraped free of adhering flesh and fat.

The flat stones set in mortar around the tanning pits are worthy of mention since they were very hard to come by. There were no natural flat stones to be had easily in the area around San Gabriel, and so a careful search had to be made for stones that would meet the requirements. It was necessary that the margin around the vats be paved so that the hides would not pick up sand and dirt when they were hauled out of the pits to be worked on. The stones are set in a gentle reverse angle away from the pits so that water and elements removed from the hides would not flow back into the pits.

The process of tanning requires an adequate water supply and the Mission fathers made sure that they had it. Water was brought through earthenware culverts and open ditches from what became known as Wilson's Lake in San Marino. This lake is now dry and is the area known today as Lacey Park. Water was tapped into the Mission yard

by means of an underground earthenware pipe, which ended in a central aqueduct in the yard. Another earthenware pipe took water from this fountain to the tanning pits.

The pits themselves are actually two pits: one large pit with two dividing walls of different heights within it, and another deeper, narrower pit beyond it. The pits are so arranged that water can run from one into the other and then into the final deep catch-pit. A system of masonry channels and ceramic pipes carry this run-off from the large pit to the catch-pit. Water in the catch-pit, whether lime water or tanning water, could be re-used, or emptied.

The second step in the process of tanning was "liming." Preceding this step the lime had to be prepared. Lime used in the tannery was first burned in the mission lime kilns. It was delivered fresh and "unslaked" or, in the "stone," to the area where it was to be used, with the special admonition that it should be kept, in the meantime, where neither air nor moisture could get to it. A half hogshead near the tanning vats was sufficiently large to prepare enough lime-water for a pack of 120 to 140 hides. A bushel of lime was put into the barrel and then several pails of water



View across the top of the soap factory showing the furnaces. Note the channel still showing at the left of the second furnace to carry off overflow from the boiling cauldrons.



Hides in soak, stirred by a neophyte, occupy two vats in the tannery. The nearer, empty vat was often used to mix solutions in. The deeper, catch-basin vat is at the far end at the wall. The drying house for hides adjoins the vats. Tubs of lime, a pile of hides to be tanned and a carreta transporting a hide complete the scene. Walls were of adobe painted with lime to prevent rain from washing them away.

were poured in upon the lime at careful intervals, to dampen it and allow its heat chemicalization to act. The hogshead was tightly covered with a thick canvas until the lime was thoroughly slaked. When the reaction was complete, the hogshead was filled with water and thoroughly stirred, allowing all grit and unslaked lime lumps to drop to the bottom. This pure lime water was then poured into the vat and the hides put into it.

This liming process served a two-fold purpose. It not only made the hair easy to remove but it also made the hide temporarily more porous to better receive the working of the tanning liquids. Hides were left in this lime solution for three or four days before being taken out and de-haired and scraped.

The hides were next washed and re-washed to remove the lime and made ready for the next process, the actual tanning.

The principal tanning agent was oak bark, gathered from trees throughout the region. Added to it were other woods, fruit and leaves. The oak bark was ground in the Mission mill and combined with the other ingredients of the local recipe to make up the tanning substance. The bottom of a vat was sprinkled liberally with the pulverized tan-

ning agent and a hide laid upon it. Another layer of ground bark and another hide on top of that was put down, and so on, until the vat was full. Water was then poured over the pack and the actual tanning commenced; it was to continue in this state for from three to six months—though during that period the water and bark might be changed several times.

At the conclusion of the tanning process the hides were removed from the solution and thoroughly washed and scrubbed to remove all bits of bark. While still wet, the hides then had oil, grease or tallow rubbed into them to replace natural oils lost in the tanning. The hides were then hung in a drying room near the vats so that their drying would not be too fast or too slow.

With the process of tanning so laborious and lengthy, and with hides so plentiful, many uses for skins not so carefully "cured" were found. Hides sprinkled with salt while they were initially stretched on the ground to dry served admirably as door coverings, bed-sacking, for re-bottomed chairs, and for making buckets and all sorts of things. Rawhide could be made soft and pliant by working tallow into the hide and many lariats were made in this fashion.

The other major industry of this San Gabriel Mission yard involved the fat rendering furnaces. These brick and mortar kilns had enormous capacity to reduce the fats accruing from the slaughter of so many cattle. Suet, the hard fat around the kidneys and loins, was cooked into tallow, strained in porous bags, and put away to be used in candle-making, or bagged for export; other fats were rendered and used in making soap.

Only the furnaces of this rendering works now remain. When in use, each of the four furnaces contained a huge iron cauldron—said to have been procured from whaling vessels—with strips of sheet iron ten inches wide lining the top of the furnace opening. The furnaces were fired from below through openings in the side walls. The cauldrons were stolen from the Mission during the Mexican war in California and the factory was used very little after that. Each of the furnaces formerly was roofed, with oak pillars rising from the sides of the furnaces to support the roofs. The insets are still visible in the outside furnace walls where the pillars were anchored. The roofing material was metal, obtained from Mexico.

Along the tops of the walls of the furnaces the channels that were



ED DAMECKI, who assembled the research and built and cast the models of the San Gabriel Mission yard, was well qualified. During World War II, as one of only seven photogrammetrists with the RAF, Mr. Damecki detected the irregularity in the contours of land and sea masses in aerial photography of a Norwegian fjord which led to the discovery and destruction of the pocket battleship "Scharnhorst." Mr. Damecki also constructed for the RAF a scale model of the Ploesti oil fields in Roumania, enabling British pilots to plot their bombing runs and targets with accuracy.

Born in Poland, Mr. Damecki was educated in the field of Geodesy at the Polish University in Warsaw and in France. He was a member of the Polish Geographic Institute until the Nazi invasion of Poland. After the collapse of Poland Mr. Damecki escaped across Europe from "a number of prisons" in his army uniform and finally reached England, where he came to the attention of Randolph Churchill and the RAF photographic section.

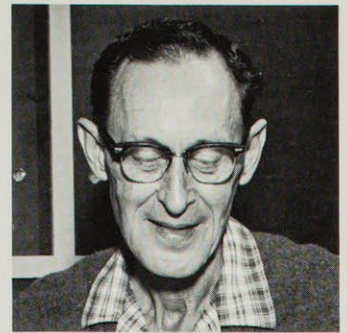
Mr. Damecki is at present constructing a model of an early California oil field for the Smithsonian Institute. His model of the Mendenhall Glacier is on exhibit in Juneau, Alaska at the site of the glacier.



ROBERT RAITCH, formerly with the Education Division, now Audio Visual Coordinator at the County Museum of Art, designed and cast the metal carreta for the Mission yard model.



PETER ANTHEIL, preparator in the Division of Education was responsible for final painting and assembling of the Museum yard.



KEN GOOD, preparator in the Division of Education, cut and shaped architectural trees for mounting on the model of the Mission church.

made to carry off the liquids that bubbled over the cauldrons may still be seen.

Soap was made from greasier fats than tallow. Ordinarily it was rendered during the slaughtering season, strained, then stored for the completion of soap making during the cooler months, though the rainy months were avoided for soap making because of the need to keep the firewood dry.

Wood ashes taken from the furnaces were leached in large kettles and the leachings, containing sodium and potassium carbonates were used in the manufacture of soap. In the actual manufacture of soap, the ashes-water was cooked with the boiled fats for the required time until the soft soap formed on the top of the water. This soft soap was skimmed off and poured into moulds to set and dry.

To keep the roaring furnaces going, trees were cut down for miles

around the Mission. Fortunately, the area had a heavy growth of trees of various types. The supply of firewood was swelled by prunings from the extensive orchards planted and maintained by the Mission.

While the big businesses were the tannery and the rendering furnaces, another fascinating enterprise took place there. In 1830, under the direction of the ex-pirate Joseph Chapman, a ninety-nine ton topsail schooner was built. This was the first ship to be built from the keel up in California. (Other ships had been built at Santa Barbara, using the keels of shipwrecked vessels.) This schooner was then disassembled, carted to the ocean and reassembled to be used in coastal trade for several years. Prefabrication came early to California.

The Mission Quadrangle with its many skilled Indian artisans occupied the buildings which lined one side of the Mission yard. Only the

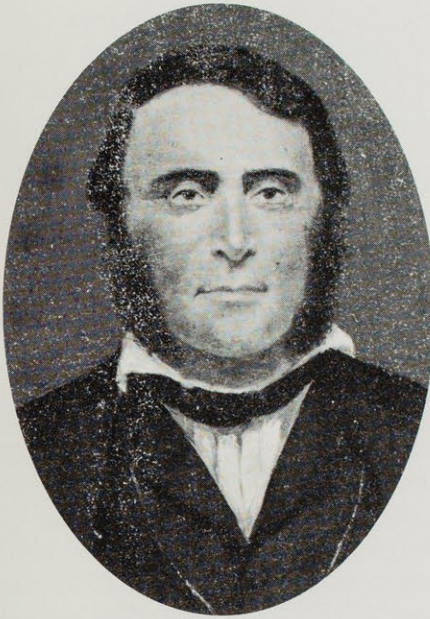
low foundation walls remain of that string of busy workshops. Still, the reminder is there of the feudal communal life that once existed at this early, civilizing outpost in California; and the more substantial remains of the tannery and soap factory speak of the busy productive life during Mission Days in California.

The Education Division of the Museum now has twenty duplicate models of the Mission Yard, with explanatory legends describing the processes used in tanning and soap making. These are available, as are all of the Education Division's lending materials, to schools and all interested persons who wish to borrow them.

[The writer would like to acknowledge the help of Thomas Workman Temple III, San Gabriel Mission historian, and Ed Damecki in compiling research for this article.]

MEMOIRS AND MOMENTOS —THE FRAGMENTS OF HISTORY

by William Mason
Associate Curator of Archives



Don Juan Avila, "El Rico"

This portrait is now on display at the Charles W. Bowers Memorial Museum in Santa Ana. It may have been painted about the same time as that of his father.



Don Antonio Ignacio Avila

A portrait painted probably a short while before his death in 1858.



The Avila Adobe on Olvera Street, possibly built in 1818. Francisco Avila was the occupant in the 1820's, and his widow, Encarnacion Sepulveda de Avila, lived there for a time.

When a shortstop named Avila played baseball at Chavez Ravine, it is possible he was playing on land that belonged to his ancestors.

We say possibly because we have no way of knowing if Bobby Avila is related to the prominent Spanish family who owned Chavez Ravine when this area was the extreme northern end of the pueblo of Los Angeles.

However, thanks to descendants of the early illustrious Avila family, there is much that we do know about Cornelio Avila and his progeny.

We know that, as early settlers of Los Angeles, the Avila family contributed its full share to the colonization of California. Like so many of the pioneers who came up from Mexico, Cornelio Avila was a native of Sinaloa. With his wife and family, he left the town of El Fuerte for Baja California during the 1770's. According to family tradition, the Avilas were to help colonize the sparsely populated peninsula and also to import fruit trees and new plants for the Californias. This is borne out by a few scattered references to Cornelio Avila in the California archives.

Though there is little tangible evidence of the family's presence in Alta California prior to 1793, there is the suggestion that Cornelio Avila had been in California at an earlier date. A reference to him in 1791 implies that he was transporting fruits or fruit trees to Alta California, while his son, Jose Santa Ana Avila, joined the Cavalry company at Santa Barbara that same year. His family, however, may not have come to California from Baja California until 1793 or 1794. The Avilas appear to have lived at Santa Barbara for a short time and then moved to Los Angeles, where Cornelio lived until his death in 1800. He made his living raising cattle, which he kept in the San Fernando Valley until the Mission was founded in 1797; after that he evidently grew some crops in the pueblo.

Two of Cornelio's sons, Anastacio and Antonio Ignacio, played important roles in the development of

the pueblo of Los Angeles. These two men were stockraisers, farmers and local politicians. Anastacio was **alcade** in 1820-21; his brother, Antonio Ignacio, was **regidor**. These offices corresponded roughly to mayor and councilman, respectively.

Antonio Ignacio Avila was recipient of Rancho Sauzal Redondo and had probably occupied the rancho prior to 1822, when he was given formal permission by the law to do so. This rancho was on the coast between what is now Venice and Redondo Beach, California, and ran inland to the rancho of Tajauta, in the vicinity of Compton. Tajauta belonged to his brother, Anastacio, so it could be said that the Avilas owned a large portion of southwest Los Angeles County.

Another Avila holding, less extensive in acreage, was the aforementioned Chavez Ravine and the flatland to the south and east of it. Sometime prior to 1820, another

brother, Francisco Avila, built an adobe house on what was later called Olvera Street. It is still standing as the famous Avila Adobe, which today is a tourist attraction.

We are able to find more about Antonio Ignacio Avila than one might expect because his son, Juan, left his own memoirs to the Bancroft Collection when Hubert Howe Bancroft was compiling his history on California. Juan Avila devoted considerable space to tales of his father's ability in tracking runaway neophyte Indians and horse thieves.

It seems that Antonio Ignacio was a **juez del campo**, or judge of the plains, for many years. He was such a noted tracker of horsemen and stolen beasts that he was able to follow the trail of a horseman without dismounting from his own horse, the usual custom of men who followed traces left by others.

The raid made by horse thieves from New Mexico in 1830 is described by Juan Avila, who, with

his father and many others, took part in the pursuit and capture of some of the thieves.

Juan Avila recounts his own role during the war between Mexico and the United States in 1846-47. It was he who carried a flag of truce from Los Angeles to Stockton's forces, as they advanced against the pueblo in January, 1847.

After the United States conquest of California, Juan Avila became a well-known cattleman of San Juan Capistrano. He must have been prosperous enough, for he was nicknamed "**El Rico**." He was owner of Rancho Niguel, near San Juan Capistrano Mission, which even a century ago was considered to be a good piece of real estate.

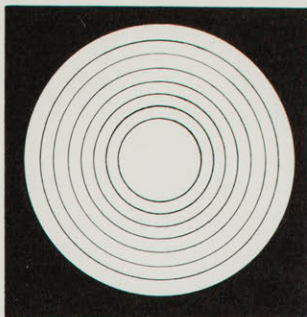
Judge Benjamin Hayes speaks highly of Juan Avila in his diary, adding that he was one of the few Californians he had met that could be considered thrifty, though he was not miserly. Judge Hayes was the recipient of Don Juan's hospitality several times.

The Los Angeles County Museum of Natural History has acquired several pictures, costumes, and other mementos from various descendants of Cornelio Avila, especially those of Antonio and Anastacio. The del Valle Collection includes much Avila material, since the wife of Ignacio del Valle was a granddaughter of Antonio Ignacio Avila. Several pictures and documents which belonged to the children of Anastacio Avila have been contributed by the heirs. A copy of the Juan Avila memoirs has been acquired by the Museum, as well as a painting of Antonio Ignacio Avila, which now is part of the exhibit in the California History Gallery.

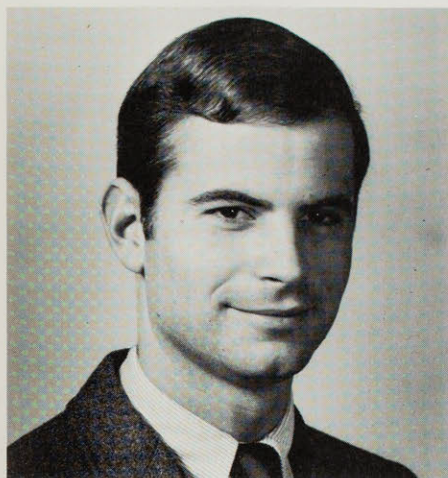
It is fitting that these materials should be on display in the Museum, for the Avila family, their relatives, their friends and their townspeople in northwestern Mexico made up about eighty percent of the settlers in Southern California, from Santa Barbara to San Diego. Thus northwestern Mexico, and particularly Sinaloa, might be considered the cradle of Alta California.

This is probably Juan Avila's house in the town of San Juan Capistrano, as pictures of the structure at Niguel indicate that the ranch house was larger.





MUSEUM SPOTLIGHT



Robert Gustafson

Robert Gustafson has recently joined the museum staff as a Preparator in Botany. A native of Los Angeles, Mr. Gustafson was educated in the City, receiving his B.S. degree from Loyola University and his Master's degree at U.C.L.A. The new Preparator is no stranger to the Museum, as he was employed as a Student Professional in the Botany Section for more than two years before assuming his new role. Mr. Gustafson's primary field of interest deals with plant taxonomy.

Gaal Receives Ph.D.

Robert Gaal, Curator of Geology-Mineralogy in the Earth Sciences division, received a Ph.D in Geology from the University of Southern California in February. The subject of his thesis was "The Marine Geology of the Santa Catalina Basin, California." Dr. Gaal's achievement adds distinction to the growing professional strength in the museum.



James Walker

"Roping the Bear" by James Walker

The History Division was fortunate to secure for a two month (February and March) exhibit, five paintings by the nineteenth century California artist, James Walker. The exhibit included "Cattle Drive" (No. 1 and No. 2) and "Roping the Bear," three large canvases painted as a result of Walker's travels in Southern California in 1876-77, as well as two small beautifully detailed pictures of "El Patron" and "El Vaquero," which were probably executed during, or as a result of, the artist's visit to General Beale's Tejon Ranch and John Forester's Santa Margarita Ranch.

Born in England in 1819, James Walker migrated with his parents to New York at an early age. He was an interpreter with General Winfield Scott during the Mexican War and staff artist with the Union Army during the Civil War, which enabled him to execute a number of epic battlefield paintings, the most notable being "The Battle of Chapultepec" which hangs in our national capital.

Mr. Walker came to California in the early 1870's and opened a studio in San Francisco. His sketching tours took him the full length of the state, but it was while he was in Southern California in 1876-77 that the sketches for these paintings were made.

James Walker has left to his adopted nation a visual record of some of the most memorable triumphs on the field of honor and a romantic legacy to the memory of the pastoral existence of the early Californians.

These paintings were lent through the courtesy of the California Historical Society.

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ELEPHANTS

the journey of
five elephants from
the Kenya bush to
Los Angeles
County Museum
of Natural History

